SiBE341001_B

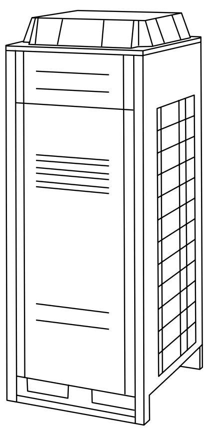
R-410A

Service Manual

VRV III-Q

RQYQ140 · 180PY1, RQCYQ280~540PY1
R-410A Heat Pump 50Hz

RQCEQ280~848PY1
R-410A Heat Recovery 50Hz



VRV III-Q R-410A Heat Pump / Heat Recovery 50Hz

1. Introduction

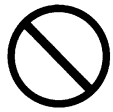
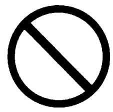
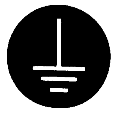
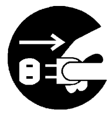
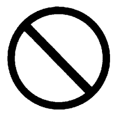
1.1 Safety Cautions

Cautions and Warnings

- Be sure to read the following safety cautions before conducting repair work.
- The caution items are classified into " **Warning**" and " **Caution**". The " **Warning**" items are especially important since they can lead to death or serious injury if they are not followed closely. The " **Caution**" items can also lead to serious accidents under some conditions if they are not followed. Therefore, be sure to observe all the safety caution items described below.
- About the pictograms
  - △ This symbol indicates an item for which caution must be exercised. The pictogram shows the item to which attention must be paid.
  - ○ This symbol indicates a prohibited action. The prohibited item or action is shown inside or near the symbol.
  - ● This symbol indicates an action that must be taken, or an instruction. The instruction is shown inside or near the symbol.
- After the repair work is complete, be sure to conduct a test operation to ensure that the equipment operates normally, and explain the cautions for operating the product to the customer

1.1.1 Caution in Repair

Warning	
Be sure to disconnect the power cable plug from the plug socket before disassembling the equipment for a repair. Working on the equipment that is connected to a power supply can cause an electrical shock. If it is necessary to supply power to the equipment to conduct the repair or inspecting the circuits, do not touch any electrically charged sections of the equipment.	
If the refrigerant gas discharges during the repair work, do not touch the discharging refrigerant gas. The refrigerant gas can cause frostbite.	
When disconnecting the suction or discharge pipe of the compressor at the welded section, release the refrigerant gas completely at a well-ventilated place first. If there is a gas remaining inside the compressor, the refrigerant gas or refrigerating machine oil discharges when the pipe is disconnected, and it can cause injury.	
If the refrigerant gas leaks during the repair work, ventilate the area. The refrigerant gas can generate toxic gases when it contacts flames.	
The step-up capacitor supplies high-voltage electricity to the electrical components of the outdoor unit. Be sure to discharge the capacitor completely before conducting repair work. A charged capacitor can cause an electrical shock.	
Do not start or stop the air conditioner operation by plugging or unplugging the power cable plug. Plugging or unplugging the power cable plug to operate the equipment can cause an electrical shock or fire.	

Caution	
Do not repair the electrical components with wet hands. Working on the equipment with wet hands can cause an electrical shock.	
Do not clean the air conditioner by splashing water. Washing the unit with water can cause an electrical shock.	
Be sure to provide the grounding when repairing the equipment in a humid or wet place, to avoid electrical shocks.	
Be sure to turn off the power switch and unplug the power cable when cleaning the equipment. The internal fan rotates at a high speed, and cause injury.	
Do not tilt the unit when removing it. The water inside the unit can spill and wet the furniture and floor.	
Be sure to check that the refrigerating cycle section has cooled down sufficiently before conducting repair work. Working on the unit when the refrigerating cycle section is hot can cause burns.	
Use the welder in a well-ventilated place. Using the welder in an enclosed room can cause oxygen deficiency.	

1.1.2 Cautions Regarding Products after Repair

Warning	
Be sure to use parts listed in the service parts list of the applicable model and appropriate tools to conduct repair work. Never attempt to modify the equipment. The use of inappropriate parts or tools can cause an electrical shock, excessive heat generation or fire.	
When relocating the equipment, make sure that the new installation site has sufficient strength to withstand the weight of the equipment. If the installation site does not have sufficient strength and if the installation work is not conducted securely, the equipment can fall and cause injury.	
Be sure to install the product correctly by using the provided standard installation frame. Incorrect use of the installation frame and improper installation can cause the equipment to fall, resulting in injury.	For integral units only
Be sure to install the product securely in the installation frame mounted on a window frame. If the unit is not securely mounted, it can fall and cause injury.	For integral units only
Be sure to use an exclusive power circuit for the equipment, and follow the technical standards related to the electrical equipment, the internal wiring regulations and the instruction manual for installation when conducting electrical work. Insufficient power circuit capacity and improper electrical work can cause an electrical shock or fire.	

Warning	
Be sure to use the specified cable to connect between the indoor and outdoor units. Make the connections securely and route the cable properly so that there is no force pulling the cable at the connection terminals. Improper connections can cause excessive heat generation or fire.	
When connecting the cable between the indoor and outdoor units, make sure that the terminal cover does not lift off or dismount because of the cable. If the cover is not mounted properly, the terminal connection section can cause an electrical shock, excessive heat generation or fire.	
Do not damage or modify the power cable. Damaged or modified power cable can cause an electrical shock or fire. Placing heavy items on the power cable, and heating or pulling the power cable can damage the cable.	
Do not mix air or gas other than the specified refrigerant (R-410A) in the refrigerant system. If air enters the refrigerating system, an excessively high pressure results, causing equipment damage and injury.	
If the refrigerant gas leaks, be sure to locate the leak and repair it before charging the refrigerant. After charging refrigerant, make sure that there is no refrigerant leak. If the leak cannot be located and the repair work must be stopped, be sure to perform pump down and close the service valve, to prevent the refrigerant gas from leaking into the room. The refrigerant gas itself is harmless, but it can generate toxic gases when it contacts flames, such as fan and other heaters, stoves and ranges.	
When replacing the coin battery in the remote controller, be sure to disposed of the old battery to prevent children from swallowing it. If a child swallows the coin battery, see a doctor immediately.	

Caution	
Installation of a leakage breaker is necessary in some cases depending on the conditions of the installation site, to prevent electrical shocks.	
Do not install the equipment in a place where there is a possibility of combustible gas leaks. If a combustible gas leaks and remains around the unit, it can cause a fire.	
Be sure to install the packing and seal on the installation frame properly. If the packing and seal are not installed properly, water can enter the room and wet the furniture and floor.	For integral units only

1.1.3 Inspection after Repair

Warning	
Check to make sure that the power cable plug is not dirty or loose, then insert the plug into a power outlet all the way. If the plug has dust or loose connection, it can cause an electrical shock or fire.	
If the power cable and lead wires have scratches or deteriorated, be sure to replace them. Damaged cable and wires can cause an electrical shock, excessive heat generation or fire.	
Do not use a joined power cable or extension cable, or share the same power outlet with other electrical appliances, since it can cause an electrical shock, excessive heat generation or fire.	

Caution	
Check to see if the parts and wires are mounted and connected properly, and if the connections at the soldered or crimped terminals are secure. Improper installation and connections can cause excessive heat generation, fire or an electrical shock.	
If the installation platform or frame has corroded, replace it. Corroded installation platform or frame can cause the unit to fall, resulting in injury.	
Check the grounding, and repair it if the equipment is not properly grounded. Improper grounding can cause an electrical shock.	
Be sure to measure the insulation resistance after the repair, and make sure that the resistance is 1 MΩ or higher. Faulty insulation can cause an electrical shock.	
Be sure to check the drainage of the indoor unit after the repair. Faulty drainage can cause the water to enter the room and wet the furniture and floor.	

1.1.4 Using Icons

Icons are used to attract the attention of the reader to specific information. The meaning of each icon is described in the table below:

1.1.5 Using Icons List

Icon	Type of Information	Description
Note:	Note	A “note” provides information that is not indispensable, but may nevertheless be valuable to the reader, such as tips and tricks.
Caution	Caution	A “caution” is used when there is danger that the reader, through incorrect manipulation, may damage equipment, loose data, get an unexpected result or has to restart (part of) a procedure.
Warning	Warning	A “warning” is used when there is danger of personal injury.
	Reference	A “reference” guides the reader to other places in this binder or in this manual, where he/she will find additional information on a specific topic.

1.2 PREFACE

Thank you for your continued patronage of Daikin products.

This is the new service manual for Daikin's Year 2010 VRVIII-Q series Heat Pump System.
Daikin offers a wide range of models to respond to building and office air conditioning needs.
We are confident that customers will be able to find the models that best suit their needs.

This service manual contains information regarding the servicing of VRVIII-Q series R-410A Heat Pump, Heat Recovery System.

December, 2010

After Sales Service Division

Part 1
General Information

1. Model Names of Indoor / Outdoor Units

Outdoor Unit

Series	Model Name				Power Supply
Heat Pump	RQYQ	140P	180P		Y1
Heat Recovery	RQEQ	140P	180P	212P	

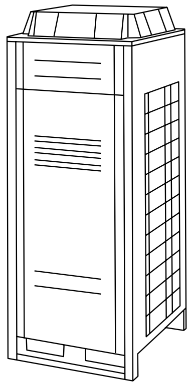
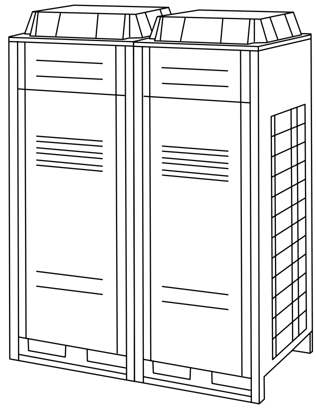
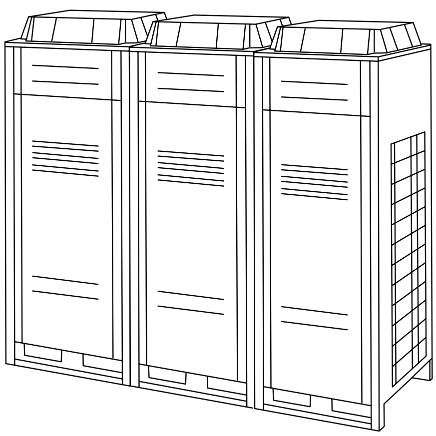
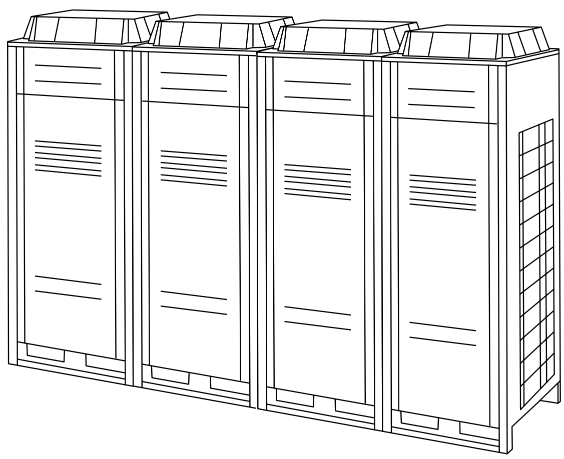
BS Unit

Type	Model Name				Power Supply
Heat Recovery Series	BSVQ	100P	160P	250P	V1
	BSV	4Q100P	6Q100P		

Power Supply: Y1 : 3ϕ, 380~415V, 50Hz
V1 : 1ϕ, 220~240V, 50Hz

2. External Appearance

2.1 Outdoor Units

RQYQ140, 180PY1 RQEQ140, 180, 212PY1	RQCYQ280, 360PY1 RQCEQ280, 360PY1
 5, 6.5, 7.5 HP	 10, 13 HP
RQCYQ460, 500, 540PY1 RQCEQ460, 500, 540, 636PY1	**RQCEQ712, 744, 816, 848PY1**
 16, 18, 20, 22 HP	 24, 26, 28, 30 HP

3. Combination of Outdoor Units

Heat Pump Series

System Capacity	Number of Units	RQYQ140PY1	RQYQ180PY1	Outdoor Unit Multi Connection Piping Kit (Option)
5HP	1	●		—
6.5HP	1		●	
10HP	2	●●		BHFP22P36C
13HP	2		●●	
16HP	3	●●	●	BHFP22P54C
18HP	3	●	●●	
20HP	3		●●●	

Heat Recovery Series

System Capacity	Number of Units	RQEQ140PY1	RQEQ180PY1	RQEQ212PY1	Outdoor Unit Multi Connection Piping Kit (Option)
10HP	2	●●			BHFP26P36C
13HP	2		●●		
16HP	3	●●	●		BHFP26P63C
18HP	3	●	●●		
20HP	3		●●●		
22HP	3			●●●	
24HP	4	●	●●	●	BHFP26P84C
26HP	4	●	●	●●	
28HP	4		●	●●●	
30HP	4			●●●●	

4. Model Selection

VRV III Heat Recovery Series

Connectable indoor units number and capacity

Heat Pump Series

HP	5HP	6.5HP	10HP	13HP	16HP	18HP	20HP
System name	RQYQ140PY1	RQYQ180PY1	RQCYQ280PY1	RQCYQ360PY1	RQCYQ460PY1	RQCYQ500PY1	RQCYQ540PY1
Outdoor unit 1	RQYQ140PY1	RQYQ180PY1	RQYQ140PY1	RQYQ180PY1	RQYQ140PY1	RQYQ140PY1	RQYQ180PY1
Outdoor unit 2	–	–	RQYQ140PY1	RQYQ180PY1	RQYQ140PY1	RQYQ180PY1	RQYQ180PY1
Outdoor unit 3	–	–	–	–	RQYQ180PY1	RQYQ180PY1	RQYQ180PY1
Total number of connectable indoor units	8	10	16	20	26	29	33
Total capacity of connectable indoor units (kW)	7.0 ~ 18.2	9.0 ~ 23.4	14.0 ~ 36.4	17.8 ~ 46.2	22.5 ~ 58.5	25.0 ~ 65.0	28.0 ~ 72.8

Heat Recovery Series

HP	10HP	13HP	16HP	18HP	20HP	22HP	24HP	26HP	28HP	30HP
System name	RQCEQ 280PY1	RQCEQ 360PY1	RQCEQ 460PY1	RQCEQ 500PY1	RQCEQ 540PY1	RQCEQ 636PY1	RQCEQ 712PY1	RQCEQ 744PY1	RQCEQ 816PY1	RQCEQ 848PY1
Outdoor unit 1	RQEQ 140PY1	RQEQ 180PY1	RQEQ 180PY1	RQEQ 180PY1	RQEQ 180PY1	RQEQ 212PY1	RQEQ 212PY1	RQEQ 212PY1	RQEQ 212PY1	RQEQ 212PY1
Outdoor unit 2	RQEQ 140PY1	RQEQ 180PY1	RQEQ 140PY1	RQEQ 180PY1	RQEQ 180PY1	RQEQ 212PY1	RQEQ 180PY1	RQEQ 212PY1	RQEQ 212PY1	RQEQ 212PY1
Outdoor unit 3	–	–	RQEQ 140PY1	RQEQ 140PY1	RQEQ 180PY1	RQEQ 212PY1	RQEQ 180PY1	RQEQ 180PY1	RQEQ 212PY1	RQEQ 212PY1
Outdoor unit 4	–	–	–	–	–	–	RQEQ 140PY1	RQEQ 140PY1	RQEQ 180PY1	RQEQ 212PY1
Total number of connectable indoor units	16	20	26	29	33	36	40	43	47	50
Total capacity of connectable indoor units (kW)	14.0 ~ 36.4	18.0 ~ 46.2	23.0 ~ 59.8	25.0 ~ 65.0	27.0 ~ 70.2	31.8 ~ 82.7	35.6 ~ 92.6	37.2 ~ 96.7	40.8 ~ 106	42.4 ~ 110

Part 2
Specifications

1. Specifications

1.1 Outdoor Units

Heat Pump Series <RQ(C)YQ-P>

Model Name			RQYQ140PY1	RQYQ180PY1
★1 Cooling Capacity		kcal / h	12,000	15,500
		Btu / h	47,800	61,400
		kW	14.0	18.0
★2 Heating Capacity		kcal / h	13,800	17,200
		Btu / h	54,600	68,200
		kW	16.0	20.0
Casing Color			Ivory White 5Y7.5/1	Ivory White 5Y7.5/1
Dimensions: (H×W×D)		mm	1680×635×765	1680×635×765
Heat Exchanger			Cross Fin Coil	Cross Fin Coil
Comp.	Type		Hermetically Sealed Scroll Type	Hermetically Sealed Scroll Type
	Piston Displacement	m^3/h	13.34	15.75
	Number of Revolutions	r.p.m	6,300	7,440
	Motor Output×Number of Units	kW	2.8×1	3.3×1
	Starting Method		Soft Start	Soft Start
Fan	Type		Propellor Fan	Propellor Fan
	Motor Output	kW	0.35×1	0.35×1
	Airflow Rate	m^3/min	95	110
	Drive		Direct Drive	Direct Drive
Connecting Pipes	Liquid Pipe		ϕ9.5 C1220T (Brazing Connection)	ϕ9.5 C1220T (Brazing Connection)
	Gas Pipe		ϕ15.9 C1220T (Brazing Connection)	ϕ19.1 C1220T (Brazing Connection)
Mass (Weight)		kg	175	175
Safety Devices			High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector	High Pressure Switch, Fan Driver Overload Protector, Overcurrent Relay, Inverter Overload Protector
Defrost Method			Deicer	Deicer
Capacity Control		%	25~100	21~100
Refrigerant	Refrigerant Name		R-410A	R-410A
	Charge	kg	11.1	11.1
	Control		Electronic Expansion Valve	Electronic Expansion Valve
Refrigerator Oil			Refer to the nameplate of compressor	Refer to the nameplate of compressor
Standard Accessories			Installation Manual, Operation Manual, Connection Pipes, Clamps	Installation Manual, Operation Manual, Connection Pipes, Clamps
Drawing No.			C: 4D066320A	4D066321A

Notes:

★1 Indoor temp. : 27°CDB, 19.0°CWB / outdoor temp. : 35°CDB / Equivalent piping length : 7.5m, level difference : 0m.

★2 Indoor temp. : 20°CDB / outdoor temp. : 7°CDB, 6°CWB / Equivalent piping length : 7.5m, level difference : 0m.

Conversion Formulae
kcal/h=kW×860 Btu/h=kW×3412 cfm=m^3/min×35.3

Model Name (Combination Unit)			RQCYQ280PY1	RQCYQ360PY1
Model Name (Independent Unit)			RQYQ140PY1+RQYQ140PY1	RQYQ180PY1+RQYQ180PY1
★1 Cooling Capacity		kcal / h	24,000	31,000
		Btu / h	95,600	122,800
		kW	28.0	36.0
★2 Heating Capacity		kcal / h	27,600	34,400
		Btu / h	109,200	136,400
		kW	32.0	40.0
Casing Color			Ivory White 5Y7.5/1	Ivory White 5Y7.5/1
Dimensions: (H×W×D)		mm	1680×635×765+1680×635×765	1680×635×765+1680×635×765
Heat Exchanger			Cross fin coil	Cross fin coil
Comp.	Type		Hermetically sealed scroll type	Hermetically sealed scroll type
	Piston Displacement	m^3/h	13.34+13.34	15.75+15.75
	Number of Revolutions	r.p.m	6300, 6300	7440, 7440
	Motor Output×Number of Units	kW	(2.8×1)+(2.8×1)	(3.3×1)+(3.3×1)
	Starting Method		Soft start	Soft start
Fan	Type		Propellor fan	Propellor fan
	Motor Output	kW	(0.35×1)+(0.35×1)	(0.35×1)+(0.35×1)
	Airflow Rate	m^3/min	95+95	110+110
	Drive		Direct drive	Direct drive
Connecting Pipes	Liquid Pipe		φ9.5 C1220T (Brazing connection)	φ12.7 C1220T (Brazing connection)
	Gas Pipe		φ22.2 C1220T (Brazing connection)	φ25.4 C1220T (Brazing connection)
Mass (Weight)		kg	175+175	175+175
Safety Devices			High pressure switch, fan driver overload protector, overcurrent relay, inverter overload protector	High pressure switch, fan driver overload protector, overcurrent relay, inverter overload protector
Defrost Method			Deicer	Deicer
Capacity Control		%	12-100	10-100
Refrigerant	Refrigerant Name		R-410A	R-410A
	Charge	kg	11.1+11.1	11.1+11.1
	Control		Electronic expansion valve	Electronic expansion valve
Refrigerator Oil			Refer to the nameplate of compressor	Refer to the nameplate of compressor
Standard Accessories			Installation manual, Operation manual, Connection pipes, Clamps	Installation manual, Operation manual, Connection pipes, Clamps
Drawing No.				

Notes:

★1 Indoor temp. : 27°CDB, 19.0°CWB / outdoor temp. : 35°CDB / Equivalent piping length : 7.5m, level difference : 0m.

★2 Indoor temp. : 20°CDB / outdoor temp. : 7°CDB, 6°CWB / Equivalent piping length : 7.5m, level difference : 0m.

Conversion Formulae
kcal/h=kW×860 Btu/h=kW×3412 cfm=m^3/min×35.3

Model Name (Combination Unit)			RQCYQ460PY1	RQCYQ500PY1
Model Name (Independent Unit)			**RQYQ180PY1+RQYQ140PY1+RQYQ140PY1**	**RQYQ180PY1+RQYQ180PY1+RQYQ140PY1**
★1 Cooling Capacity		kcal / h	39,600	43,000
		Btu / h	157,000	170,600
		kW	46.0	50.0
★2 Heating Capacity		kcal / h	44,700	48,200
		Btu / h	177,400	191,100
		kW	52.0	56.0
Casing Color			Ivory White 5Y7.5/1	Ivory White 5Y7.5/1
Dimensions: (H×W×D)		mm	1680×635×765+1680×635×765+1680×635×765	1680×635×765+1680×635×765+1680×635×765
Heat Exchanger			Cross fin coil	Cross fin coil
Comp.	Type		Hermetically sealed scroll type	Hermetically sealed scroll type
	Piston Displacement	m³/h	(15.75×1)+(13.34×1)+(13.34×1)	(15.75×1)+(15.75×1)+(13.34×1)
	Number of Revolutions	r.p.m	7440,6300,6300	7440,7440,6300
	Motor Output×Number of Units	kW	(3.3×1)+(2.8×1)+(2.8×1)	(3.3×1)+(3.3×1)+(2.8×1)
	Starting Method		Soft start	Soft start
Fan	Type		Propellor fan	Propellor fan
	Motor Output	kW	(0.35×1)+(0.35×1)+(0.35×1)	(0.35×1)+(0.35×1)+(0.35×1)
	Airflow Rate	m³/min	110+95+95	110+110+95
	Drive		Direct drive	Direct drive
Connecting Pipes	Liquid Pipe		ϕ12.7 C1220T (Brazing connection)	ϕ15.9 C1220T (Brazing connection)
	Gas Pipe		ϕ28.6 C1220T (Brazing connection)	ϕ28.6 C1220T (Brazing connection)
Mass (Weight)		kg	175+175+175	175+175+175
Safety Devices			High pressure switch, fan driver overload protector, overcurrent relay, inverter overload protector	High pressure switch, fan driver overload protector, overcurrent relay, inverter overload protector
Defrost Method			Deicer	Deicer
Capacity Control		%	8-100	7-100
Refrigerant	Refrigerant Name		R-410A	R-410A
	Charge	kg	11.1+11.1+11.1	11.1+11.1+11.1
	Control		Electronic expansion valve	Electronic expansion valve
Refrigerator Oil			Refer to the nameplate of compressor	Refer to the nameplate of compressor
Standard Accessories			Installation manual, Operation manual, Connection pipes, Clamps	Installation manual, Operation manual, Connection pipes, Clamps
Drawing No.				

Notes:

★1 Indoor temp. : 27°CDB, 19.0°CWB / outdoor temp. : 35°CDB / Equivalent piping length : 7.5m, level difference : 0m.

★2 Indoor temp. : 20°CDB / outdoor temp. : 7°CDB, 6°CWB / Equivalent piping length : 7.5m, level difference : 0m.

Conversion Formulae
kcal/h=kW×860 Btu/h=kW×3412 cfm=m³/min×35.3

Model Name (Combination Unit)			RQCYQ540PY1
Model Name (Independent Unit)			RQYQ180PY1+RQYQ180PY1+RQYQ180PY1
★1 Cooling Capacity		kcal / h	46,400
		Btu / h	184,200
		kW	54.0
★2 Heating Capacity		kcal / h	51,600
		Btu / h	204,700
		kW	60.0
Casing Color			Ivory White 5Y7.5/1
Dimensions: (H×W×D)		mm	1680×635×765+1680×635×765+1680×635×765
Heat Exchanger			Cross fin coil
Comp.	Type		Hermetically sealed scroll type
	Piston Displacement	m^3/h	(15.75×1)+(15.75×1)+(15.75×1)
	Number of Revolutions	r.p.m	7440, 7440, 7440
	Motor Output×Number of Units	kW	(3.3×1)+(3.3×1)+(3.3×1)
	Starting Method		Soft start
Fan	Type		Propellor fan
	Motor Output	kW	(0.35×1)+(0.35×1)+(0.35×1)
	Airflow Rate	m^3/min	110+110+110
	Drive		Direct drive
Connecting Pipes	Liquid Pipe		φ15.9 C1220T (Brazing connection)
	Gas Pipe		φ28.6 C1220T (Brazing connection)
Mass (Weight)		kg	175+175+175
Safety Devices			High pressure switch, fan driver overload protector, overcurrent relay, inverter overload protector
Defrost Method			Deicer
Capacity Control		%	7-100
Refrigerant	Refrigerant Name		R-410A
	Charge	kg	11.1+11.1+11.1
	Control		Electronic expansion valve
Refrigerator Oil			Refer to the nameplate of compressor
Standard Accessories			Installation manual, Operation manual, Connection pipes, Clamps
Drawing No.			

Notes:

★1 Indoor temp. : 27°CDB, 19.0°CWB / outdoor temp. : 35°CDB / Equivalent piping length : 7.5m, level difference : 0m.

★2 Indoor temp. : 20°CDB / outdoor temp. : 7°CDB, 6°CWB / Equivalent piping length : 7.5m, level difference : 0m.

Conversion Formulae
kcal/h=kW×860 Btu/h=kW×3412 cfm=m^3/min×35.3

Heat Recovery Series <RQCEQ-P>

Model Name (Combination Unit)			RQCEQ280PY1	RQCEQ360PY1
Model Name (Independent Unit)			RQEQ140PY1+RQEQ140PY1	RQEQ180PY1+RQEQ180PY1
★1 Cooling Capacity		kcal / h	24,000	31,000
		Btu / h	95,600	122,800
		kW	28.0	36.0
★2 Heating Capacity		kcal / h	27,600	34,400
		Btu / h	109,200	136,400
		kW	32.0	40.0
Casing Color			Ivory White 5Y7.5/1	Ivory White 5Y7.5/1
Dimensions: (H×W×D)		mm	1680×635×765+1680×635×765	1680×635×765+1680×635×765
Heat Exchanger			Cross fin coil	Cross fin coil
Comp.	Type		Hermetically sealed scroll type	Hermetically sealed scroll type
	Piston Displacement	m^3/h	(13.34×1)+(13.34×1)	(15.75×1)+(15.75×1)
	Number of Revolutions	r.p.m	6300, 6300	7440,7440
	Motor Output×Number of Units	kW	(2.8×1)+(2.8×1)	(3.3×1)+(3.3×1)
	Starting Method		Soft start	Soft start
Fan	Type		Propellor fan	Propellor fan
	Motor Output	kW	(0.35×1)+(0.35×1)	(0.35×1)+(0.35×1)
	Airflow Rate	m^3/min	95+95	110+110
	Drive		Direct drive	Direct drive
Connecting Pipes	Liquid Pipe		ϕ9.5 C1220T (Brazing connection)	ϕ12.7 C1220T (Brazing connection)
	Gas Pipe		ϕ22.2 C1220T (Brazing connection)	ϕ25.4 C1220T (Brazing connection)
Mass (Weight)		kg	175+175	175+175
Safety Devices			High pressure switch, fan driver overload protector, overcurrent relay, inverter overload protector	High pressure switch, fan driver overload protector, overcurrent relay, inverter overload protector
Defrost Method			Deicer	Deicer
Capacity Control		%	12-100	10-100
Refrigerant	Refrigerant Name		R-410A	R-410A
	Charge	kg	10.3+10.3	10.6+10.6
	Control		Electronic expansion valve	Electronic expansion valve
Refrigerator Oil			Refer to the nameplate of compressor	Refer to the nameplate of compressor
Standard Accessories			Installation manual, Operation manual, Connection pipes, Clamps	Installation manual, Operation manual, Connection pipes, Clamps
Drawing No.				

Notes:

★1 Indoor temp. : 27°CDB, 19.0°CWB / outdoor temp. : 35°CDB / Equivalent piping length : 7.5m, level difference : 0m.

★2 Indoor temp. : 20°CDB / outdoor temp. : 7°CDB, 6°CWB / Equivalent piping length : 7.5m, level difference : 0m.

Conversion Formulae
kcal/h=kW×860 Btu/h=kW×3412 cfm=m^3/min×35.3

Model Name (Combination Unit)			RQCEQ460PY1	RQCEQ500PY1
Model Name (Independent Unit)			RQEQ180PY1+RQEQ140PY1+RQEQ140PY1	RQEQ180PY1+RQEQ180PY1+RQEQ140PY1
★1 Cooling Capacity		kcal / h	38,700	43,000
		Btu / h	153,500	170,600
		kW	45.0	50.0
★2 Heating Capacity		kcal / h	44,700	48,200
		Btu / h	177,400	191,100
		kW	52.0	56.0
Casing Color			Ivory White 5Y7.5/1	Ivory White 5Y7.5/1
Dimensions: (H×W×D)		mm	1680×635×765+1680×635×765+1680×635×765	1680×635×765+1680×635×765+1680×635×765
Heat Exchanger			Cross fin coil	Cross fin coil
Comp.	Type		Hermetically sealed scroll type	Hermetically sealed scroll type
	Piston Displacement	m³/h	(15.75×1)+(13.34×1)+(13.34×1)	(15.75×1)+(15.75×1)+(13.34×1)
	Number of Revolutions	r.p.m	7440, 6300, 6300	7440, 7440, 6300
	Motor Output×Number of Units	kW	(3.3×1)+(2.8×1)+(2.8×1)	(3.3×1)+(3.3×1)+(2.8×1)
	Starting Method		Soft start	Soft start
Fan	Type		Propellor fan	Propellor fan
	Motor Output	kW	(0.35×1)+(0.35×1)+(0.35×1)	(0.35×1)+(0.35×1)+(0.35×1)
	Airflow Rate	m³/min	110+95+95	110+110+95
	Drive		Direct drive	Direct drive
Connecting Pipes	Liquid Pipe		ϕ12.7 C1220T (Brazing connection)	ϕ15.9 C1220T (Brazing connection)
	Gas Pipe		ϕ28.6 C1220T (Brazing connection)	ϕ28.6 C1220T (Brazing connection)
Mass (Weight)		kg	175+175+175	175+175+175
Safety Devices			High pressure switch, fan driver overload protector, overcurrent relay, inverter overload protector	High pressure switch, fan driver overload protector, overcurrent relay, inverter overload protector
Defrost Method			Deicer	Deicer
Capacity Control		%	8-100	7-100
Refrigerant	Refrigerant Name		R-410A	R-410A
	Charge	kg	10.6+10.3+10.3	10.6+10.6+10.3
	Control		Electronic expansion valve	Electronic expansion valve
Refrigerator Oil			Refer to the nameplate of compressor	Refer to the nameplate of compressor
Standard Accessories			Installation manual, Operation manual, Connection pipes, Clamps	Installation manual, Operation manual, Connection pipes, Clamps
Drawing No.				

Notes:

★1 Indoor temp. : 27°CDB, 19.0°CWB / outdoor temp. : 35°CDB / Equivalent piping length : 7.5m, level difference : 0m.

★2 Indoor temp. : 20°CDB / outdoor temp. : 7°CDB, 6°CWB / Equivalent piping length : 7.5m, level difference : 0m.

Conversion Formulae
kcal/h=kW×860 Btu/h=kW×3412 cfm=m³/min×35.3

Model Name (Combination Unit)			RQCEQ540PY1	RQCEQ636PY1
Model Name (Independent Unit)			RQEQ180PY1+RQEQ180PY1+RQEQ180PY1	RQEQ212PY1+RQEQ212PY1+RQEQ212PY1
★1 Cooling Capacity		kcal / h	46,400	54,700
		Btu / h	184,200	217,000
		kW	54.0	63.6
★2 Heating Capacity		kcal / h	51,600	57,800
		Btu / h	204,700	229,300
		kW	60.0	67.2
Casing Color			Ivory White 5Y7.5/1	Ivory White 5Y7.5/1
Dimensions: (H×W×D)		mm	1680×635×765+1680×635×765+1680×635×765	1680×635×765+1680×635×765+1680×635×765
Heat Exchanger			Cross fin coil	Cross fin coil
Comp.	Type		Hermetically sealed scroll type	Hermetically sealed scroll type
	Piston Displacement	m³/h	(15.75×1)+(15.75×1)+(15.75×1)	(16.89×1)+(16.89×1)+(16.89×1)
	Number of Revolutions	r.p.m	7440, 7440, 7440	7980, 7980, 7980
	Motor Output×Number of Units	kW	(3.3×1)+(3.3×1)+(3.3×1)	(3.6×1)+(3.6×1)+(3.6×1)
	Starting Method		Soft start	Soft start
Fan	Type		Propellor fan	Propellor fan
	Motor Output	kW	(0.35×1)+(0.35×1)+(0.35×1)	(0.35×1)+(0.35×1)+(0.35×1)
	Airflow Rate	m³/min	110+110+110	110+110+110
	Drive		Direct drive	Direct drive
Connecting Pipes	Liquid Pipe		ϕ15.9 C1220T (Brazing connection)	ϕ15.9 C1220T (Brazing connection)
	Gas Pipe		ϕ28.6 C1220T (Brazing connection)	ϕ28.6 C1220T (Brazing connection)
Mass (Weight)		kg	175+175+175	179+179+179
Safety Devices			High pressure switch, fan driver overload protector, overcurrent relay, inverter overload protector	High pressure switch, fan driver overload protector, overcurrent relay, inverter overload protector
Defrost Method			Deicer	Deicer
Capacity Control		%	7-100	7-100
Refrigerant	Refrigerant Name		R-410A	R-410A
	Charge	kg	10.6+10.6+10.6	11.2+11.2+11.2
	Control		Electronic expansion valve	Electronic expansion valve
Refrigerator Oil			Refer to the nameplate of compressor	Refer to the nameplate of compressor
Standard Accessories			Installation manual, Operation manual, Connection pipes, Clamps	Installation manual, Operation manual, Connection pipes, Clamps
Drawing No.				

Notes:

★1 Indoor temp. : 27°CDB, 19.0°CWB / outdoor temp. : 35°CDB / Equivalent piping length : 7.5m, level difference : 0m.

★2 Indoor temp. : 20°CDB / outdoor temp. : 7°CDB, 6°CWB / Equivalent piping length : 7.5m, level difference : 0m.

Conversion Formulae
kcal/h=kW×860 Btu/h=kW×3412 cfm=m³/min×35.3

Model Name (Combination Unit)			RQCEQ712PY1	RQCEQ744PY1
Model Name (Independent Unit)			RQEQ212PY1+RQEQ180PY1+RQEQ180PY1+RQEQ140PY1	RQEQ212PY1+RQEQ212PY1+RQEQ180PY1+RQEQ140PY1
★1 Cooling Capacity		kcal / h	61,200	64,000
		Btu / h	242,900	253,900
		kW	71.2	74.4
★2 Heating Capacity		kcal / h	67,400	69,500
		Btu / h	267,500	275,700
		kW	78.4	80.8
Casing Color			Ivory White 5Y7.5/1	Ivory White 5Y7.5/1
Dimensions: (H×W×D)		mm	1680×635×765+1680×635×765+1680×635×765+1680×635×765	1680×635×765+1680×635×765+1680×635×765+1680×635×765
Heat Exchanger			Cross fin coil	Cross fin coil
Comp.	Type		Hermetically sealed scroll type	Hermetically sealed scroll type
	Piston Displacement	m³/h	(16.89×1)+(15.75×1)+(15.75×1)+(13.34×1)	(16.89×1)+(16.89×1)+(15.75×1)+(13.34×1)
	Number of Revolutions	r.p.m	7980, 7440, 7440, 6300	7980, 7980, 7440, 6300
	Motor Output×Number of Units	kW	(3.6×1)+(3.3×1)+(3.3×1)+(2.8×1)	(3.6×1)+(3.6×1)+(3.3×1)+(2.8×1)
	Starting Method		Soft start	Soft start
Fan	Type		Propellor fan	Propellor fan
	Motor Output	kW	(0.35×1)+(0.35×1)+(0.35×1)+(0.35×1)	(0.35×1)+(0.35×1)+(0.35×1)+(0.35×1)
	Airflow Rate	m³/min	110+110+110+95	110+110+110+95
	Drive		Direct drive	Direct drive
Connecting Pipes	Liquid Pipe		ϕ15.9 C1220T (Brazing connection)	ϕ19.1 C1220T (Brazing connection)
	Gas Pipe		ϕ28.6 C1220T (Brazing connection)	ϕ31.8 C1220T (Brazing connection)
Mass (Weight)		kg	179+175+175+175	179+179+175+175
Safety Devices			High pressure switch, fan driver overload protector, overcurrent relay, inverter overload protector	High pressure switch, fan driver overload protector, overcurrent relay, inverter overload protector
Defrost Method			Deicer	Deicer
Capacity Control		%	5-100	5-100
Refrigerant	Refrigerant Name		R-410A	R-410A
	Charge	kg	11.2+10.6+10.6+10.3	11.2+11.2+10.6+10.3
	Control		Electronic expansion valve	Electronic expansion valve
Refrigerator Oil			Refer to the nameplate of compressor	Refer to the nameplate of compressor
Standard Accessories			Installation manual, Operation manual, Connection pipes, Clamps	Installation manual, Operation manual, Connection pipes, Clamps
Drawing No.				

Notes:

★1 Indoor temp. : 27°CDB, 19.0°CWB / outdoor temp. : 35°CDB / Equivalent piping length : 7.5m, level difference : 0m.

★2 Indoor temp. : 20°CDB / outdoor temp. : 7°CDB, 6°CWB / Equivalent piping length : 7.5m, level difference : 0m.

Conversion Formulae
kcal/h=kW×860 Btu/h=kW×3412 cfm=m³/min×35.3

Model Name (Combination Unit)			RQCEQ816PY1	RQCEQ848PY1
Model Name (Independent Unit)			RQEQ212PY1+RQEQ212PY1+RQEQ212PY1+RQEQ180PY1	RQEQ212PY1+RQEQ212PY1+RQEQ212PY1+RQEQ212PY1
★1 Cooling Capacity		kcal / h	70,200	72,900
		Btu / h	278,400	289,300
		kW	81.6	84.8
★2 Heating Capacity		kcal / h	75,000	77,100
		Btu / h	297.600	305,700
		kW	87.2	89.6
Casing Color			Ivory White 5Y7.5/1	Ivory White 5Y7.5/1
Dimensions: (H×W×D)		mm	1680×635×765+1680×635×765+1680×635×765+1680×635×765	1680×635×765+1680×635×765+1680×635×765+1680×635×765
Heat Exchanger			Cross fin coil	Cross fin coil
Comp.	Type		Hermetically sealed scroll type	Hermetically sealed scroll type
	Piston Displacement	m³/h	(16.89×1)+(16.89×1)+(16.89×1)+(15.75×1)	(16.89×1)+(16.89×1)+(16.89×1)+(16.89×1)
	Number of Revolutions	r.p.m	7980, 7980, 7980, 7440	7980, 7980, 7980, 7980
	Motor Output×Number of Units	kW	(3.6×1)+(3.6×1)+(3.6×1)+(3.3×1)	(3.6×1)+(3.6×1)+(3.6×1)+(3.6×1)
	Starting Method		Soft start	Soft start
Fan	Type		Propellor fan	Propellor fan
	Motor Output	kW	(0.35×1)+(0.35×1)+(0.35×1)+(0.35×1)	(0.35×1)+(0.35×1)+(0.35×1)+(0.35×1)
	Airflow Rate	m³/min	110+110+110+110	110+110+110+110
	Drive		Direct drive	Direct drive
Connecting Pipes	Liquid Pipe		ϕ19.1 C1220T (Brazing connection)	ϕ19.1 C1220T (Brazing connection)
	Gas Pipe		ϕ31.8 C1220T (Brazing connection)	ϕ31.8 C1220T (Brazing connection)
Mass (Weight)		kg	179+179+179+175	179+179+179+179
Safety Devices			High pressure switch, fan driver overload protector, overcurrent relay, inverter overload protector	High pressure switch, fan driver overload protector, overcurrent relay, inverter overload protector
Defrost Method			Deicer	Deicer
Capacity Control		%	5-100	5-100
Refrigerant	Refrigerant Name		R-410A	R-410A
	Charge	kg	11.2+11.2+11.2+10.6	11.2+11.2+11.2+11.2
	Control		Electronic expansion valve	Electronic expansion valve
Refrigerator Oil			Refer to the nameplate of compressor	Refer to the nameplate of compressor
Standard Accessories			Installation manual, Operation manual, Connection pipes, Clamps	Installation manual, Operation manual, Connection pipes, Clamps
Drawing No.				

Notes:

★1 Indoor temp. : 27°CDB, 19.0°CWB / outdoor temp. : 35°CDB / Equivalent piping length : 7.5m, level difference : 0m.

★2 Indoor temp. : 20°CDB / outdoor temp. : 7°CDB, 6°CWB / Equivalent piping length : 7.5m, level difference : 0m.

Conversion Formulae
kcal/h=kW×860 Btu/h=kW×3412 cfm=m³/min×35.3

1.2 BS Units

Model			BSVQ100P	BSVQ160P	BSVQ250P
Power Supply			1 Phase 50Hz 220 ~ 240V	1 Phase 50Hz 220 ~ 240V	1 Phase 50Hz 220 ~ 240V
Casing			Galvanized steel plate	Galvanized steel plate	Galvanized steel plate
Dimensions: (H×W×D)		mm	207×388×326	207×388×326	207×388×326
Sound absorbing thermal insulation material			Foamed polyurethane, Frame resisting needle felt	Foamed polyurethane, Frame resisting needle felt	Foamed polyurethane, Frame resisting needle felt
Piping Connection	Indoor Unit	Liquid Pipes	9.5mm C1220T (brazing connection) ★1	9.5mm C1220T (brazing connection)	9.5mm C1220T (brazing connection)
		Gas Pipes	15.9mm C1220T (brazing connection) ★1	15.9mm C1220T (brazing connection) ★2	22.2mm C1220T (brazing connection) ★3
	Outdoor Unit	Liquid Pipes	9.5mm C1220T (brazing connection)	9.5mm C1220T (brazing connection)	9.5mm C1220T (brazing connection)
		Suction Gas Pipes	15.9mm C1220T (brazing connection)	15.9mm C1220T (brazing connection) ★2	22.2mm C1220T (brazing connection) ★3
		HP/LP Gas Pipes	12.7mm C1220T (brazing connection)	12.7mm C1220T (brazing connection) ★2	19.1mm C1220T (brazing connection) ★3
Weight		kg	12	12	15
Standard Accessories			Installation manual, Attached pipe, Insulation pipe cover, Clamps	Installation manual, Attached pipe, Insulation pipe cover, Clamps	Installation manual, Attached pipe, Insulation pipe cover, Clamps
Drawing No.			4D057926A	4D057927A	4D057928

Note:
★1 In case of connecting with a 20 ~ 50 type indoor unit, match to the size of field pipe using the attached pipe.
★2 In case of connecting with indoor unit capacity index 150 or more and 160 or less, match to the size of field pipe using the attached pipe.
★3 In case of connecting with a 200 type indoor unit or indoor capacity index more than 160 and less than 200, match to the size of field pipe using the attached pipe.
(Connection between the attached pipe and the field pipe must be brazed.)

Model			BSV4Q100P	BSV6Q100P
Power Supply			1 Phase 50Hz 220~240V	1 Phase 50Hz 220~240V
Total capacity index of connectable indoor units			400 or less	600 or less
Capacity index of connectable indoor units per branch			100 or less	
No. of Connectable Indoor Units			Max. 20	Max. 30
Casing			Galvanized steel plate	Galvanized steel plate
Dimensions: (H×W×D)		mm	209×1053×635	209×1577×635
Sound Absorbing Thermal Insulation Material			Foamed polyurethane, Flame resistant needle felt	Foamed polyurethane, Flame resistant needle felt
Piping Connection	Indoor Unit	Liquid Pipes	9.5mm C1220T (brazing connection) ★1	9.5mm C1220T (brazing connection) ★1
		Gas Pipes	15.9mm C1220T (brazing connection) ★1	15.9mm C1220T (brazing connection) ★1
	Outdoor Unit	Liquid Pipes	12.7mm C1220T (brazing connection)	15.9mm C1220T (brazing connection)
		Suction Gas Pipes	28.6mm C1220T (brazing connection)	28.6mm C1220T (brazing connection)
		HP/LP Gas Pipes	19.1mm C1220T (brazing connection)	28.6mm C1220T (brazing connection)
Weight		kg	60	89
Standard Accessories			Installation manual, Attached pipe Insulation pipe cover, Clamps	Installation manual, Attached pipe Insulation pipe cover, Clamps
Drawing No.			C: 4D064131A	C: 4D064132A

Note:
★1 In case of connecting with a 20 ~ 50 type indoor unit, match to the size of field pipe using the attached pipe.

Connection Range for BS Unit

Components	Outdoor unit model name	Total capacity of connectable indoor units	Number of connectable indoor units
Indoor unit total capacity	RQCEQ280PY1	14.0 to 36.4 (56.0)	16
	RQCEQ360PY1	18.0 to 46.2 (72.0)	20
	RQCEQ460PY1	23.0 to 59.8 (92.0)	26
	RQCEQ500PY1	25.0 to 65.0 (100.0)	29
	RQCEQ540PY1	27.0 to 70.2 (108.0)	33
	RQCEQ636PY1	31.8 to 82.7 (127.2)	36
	RQCEQ712PY1	35.6 to 92.6 (142.4)	40
	RQCEQ744PY1	37.2 to 96.7 (148.8)	43
	RQCEQ816PY1	40.8 to 106 (163.2)	47
	RQCEQ848PY1	42.4 to 110 (169.6)	50

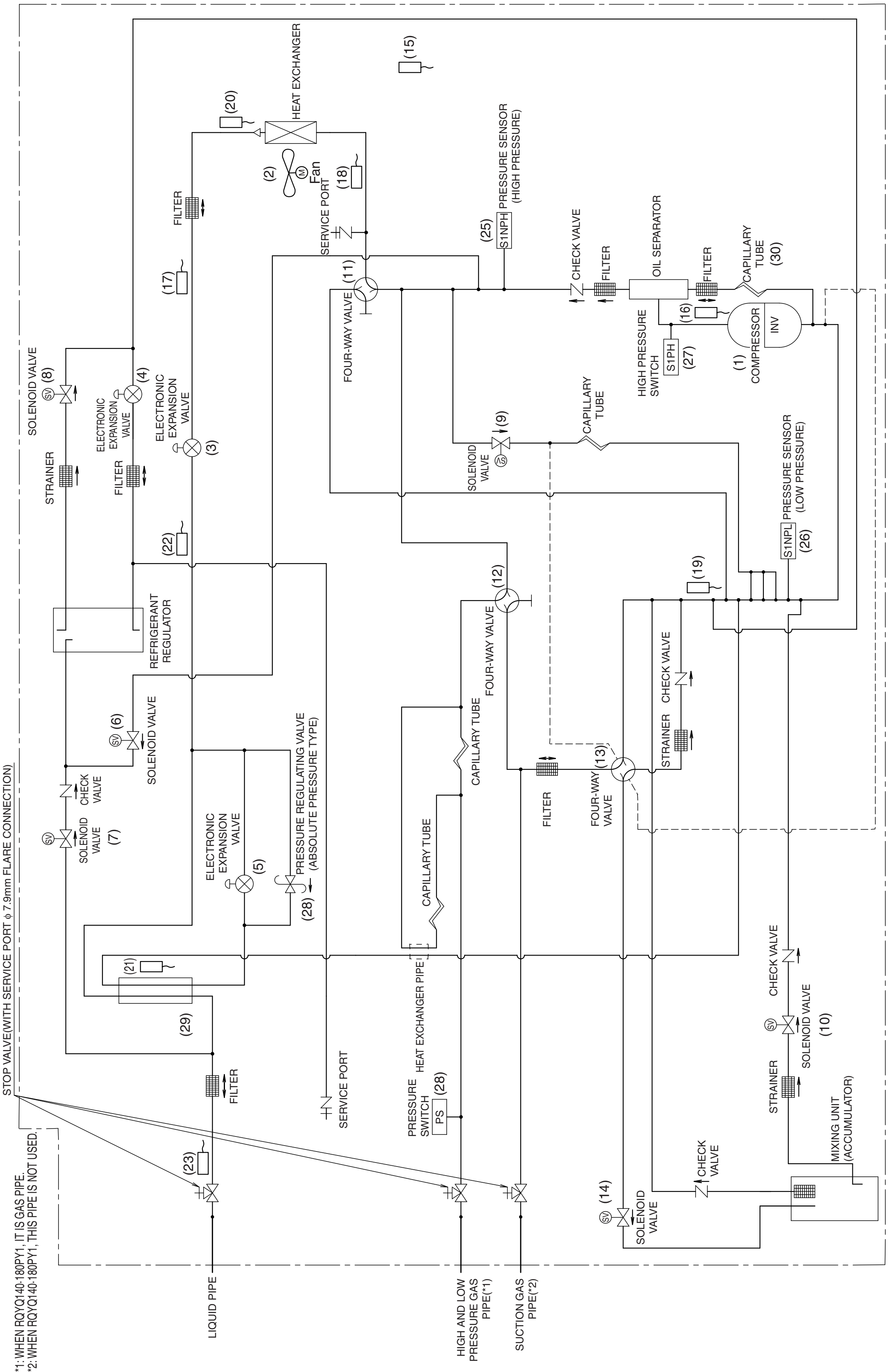
Note: ★ Values inside brackets are based on connection of indoor units rated at maximum capacity, 200% from single outdoor units, 160% from double outdoor units, 130% from triple outdoor units.

Part 3
Refrigerant Circuit

1. Refrigerant Circuit

1.1 RQYQ140 · 180PY1, RQEQ140 ~ 212PY1

No. in refrigerant system diagram	Symbol	Name	Major Function
(1)	M1C	Inverter compressor (INV.)	Inverter compressor is operated on frequencies 52Hz to 210Hz (180 class: 248Hz, 212 class: 266Hz) by using the inverter. The number of operating steps is 20. (180 class: 23 steps, 212 class: 27 steps)
(2)	M1F	Inverter fan	Because the system is an air heat exchange type, the fan is operated at 8-step rotation speed by using the inverter.
(3)	Y1E	Electronic expansion valve (Main)	While in heating operation, PI control is applied to keep the outlet superheated degree of air heat exchanger constant.
(4)	Y2E	Electronic expansion valve (Refrigerant charge)	This is used to charge refrigerant and discharge refrigerant from the refrigerant regulator.
(5)	Y3E	Electronic expansion valve (Subcooling)	PI control is applied to keep the outlet superheated degree of subcooling heat exchanger constant.
(6)	Y1S	Solenoid valve (Refrigerant regulator hot gas)	Used to charge refrigerant and discharge refrigerant from the refrigerant regulator.
(7)	Y2S	Solenoid valve (Refrigerant regulator liquid pipe)	Used to collect refrigerant to the refrigerant regulator.
(8)	Y3S	Solenoid valve (Refrigerant regulator gas vent pipe)	Used to collect refrigerant to the refrigerant regulator.
(9)	Y4S	Solenoid valve (Hot gas)	Used to prevent the low pressure from transient falling.
(10)	Y5S	Solenoid valve (Circuit of oil return)	Used to adjust the amount of oil in the mixing unit.
(11)	Y6S	Four way valve (Heat exchanger)	Used to switch the operation mode between cooling and heating.
(12)	Y7S	Four way valve (Dual pressure gas pipe)	Used to switch dual pressure gas pipe to high pressure or low pressure.
(13)	Y8S	Four way valve (Mixing unit)	Use to adjust the amount of refrigeration oil and clean pipes during check operation.
(14)	Y9S	Solenoid valve (Mixing unit inlet)	Use to adjust the amount of refrigeration oil and clean pipes during check operation. Use to prevent refrigerant from flowing into the mixing unit during normal operation.
(15)	R1T	Thermistor (Outdoor air: Ta)	Used to detect outdoor temperature, correct discharge pipe temperature and others.
(16)	R2T	Thermistor (Discharge pipe)	Used to detect discharge pipe temperature. Used for compressor temperature protection control.
(17)	R3T	Thermistor (Heat exchanger liquid pipe)	This detects temperature of liquid pipe between the air heat exchanger and main electronic expansion valve. Used to make judgements on the recover or discharge refrigerants to the refrigerant regulator.
(18)	R4T	Thermistor (Heat exchanger gas pipe)	This detects temperature of gas pipe for air heat exchanger. Used to exercise the constant control of superheated degree when an evaporator is used for outdoor unit heat exchanging.
(19)	R5T	Thermistor (Suction pipe)	Used to detect suction pipe temperature.
(20)	R6T	Thermistor (Heat exchanger deicer)	Used to detect liquid pipe temperature of air heat exchanger. Used to make judgements on defrosting operation.
(21)	R7T	Thermistor (Subcooling heat exchanger gas pipe)	This detects temperature of gas pipe on the evaporation side of subcooling heat exchanger. Used to exercise the constant control of superheated degree at the outlet of subcooled heat exchanger.
(22)	R8T	Thermistor (Subcooling heat exchanger liquid pipe)	This detects temperature of liquid pipe between the main electronic expansion valve and subcooling heat exchanger.
(23)	R9T	Thermistor (Liquid pipe)	This detects temperature of liquid pipe.
(25)	S1NPH	High pressure sensor	Used to detect high pressure.
(26)	S1NPL	Low pressure sensor	Used to detect low pressure.
(27)	S1PH	High pressure switch (For INV.)	In order to prevent the increase of high pressure when a malfunction occurs, this switch is activated at high pressure of 4.0 MPa or more to stop the compressor operation.
(28)	S2P	Pressure switch	In order to prevent the increase of field piping pressure when a malfunction occurs, this switch is activated at pressure of 3.3 MPa or more to stop the compressor operation.
(29)	—	Pressure regulating valve (Liquid pipe)	Open at 3.3 MPa or more to avoid pressure increase to prevent damage to functional parts by the pressure increase and to protect the field piping during transportation, storage and operation of the equipment.
(30)	—	Subcooling heat exchanger	Apply subcooling to liquid refrigerant.
(31)	—	Capillary tube	Used to return the refrigerating oil separated through the oil separator to the INV. compressor.

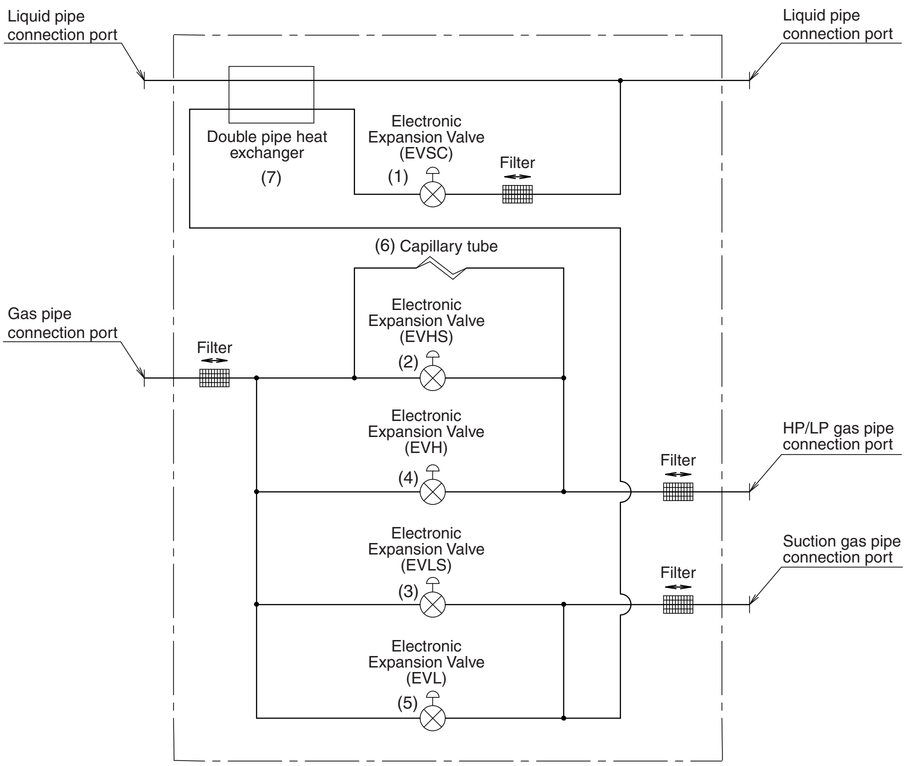

HEAT EXCHANGER
(20)
(15)
(2)
Fan
(18)
SERVICE PORT
FILTER
(17)
(11)
FOUR-WAY VALVE
(25)
S1NPH
PRESSURE SENSOR
(HIGH PRESSURE)
CHECK VALVE
FILTER
OIL SEPARATOR
FILTER
CAPILLARY TUBE
(30)
(16)
HIGH PRESSURE SWITCH
S1PH
(27)
(1)
COMPRESSOR
INV
SOLENOID VALVE
(8)
ELECTRONIC EXPANSION VALVE
(4)
ELECTRONIC EXPANSION VALVE
(3)
STRAINER
FILTER
SOLENOID VALVE
(9)
CAPILLARY TUBE
PRESSURE SENSOR
(LOW PRESSURE)
S1NPL
(26)
(22)
(19)
(12)
FOUR-WAY VALVE
REFRIGERANT REGULATOR
SOLENOID VALVE
(6)
CHECK VALVE
STRAINER
CHECK VALVE
CAPILLARY TUBE
SOLENOID VALVE
(7)
ELECTRONIC EXPANSION VALVE
(5)
PRESSURE REGULATING VALVE
(ABSOLUTE PRESSURE TYPE)
(28)
CAPILLARY TUBE
FILTER
FOUR-WAY VALVE
(13)
CHECK VALVE
SOLENOID VALVE
(10)
STRAINER
(21)
(29)
HEAT EXCHANGER PIPE
STOP VALVE(WITH SERVICE PORT φ 7.9mm FLARE CONNECTION)
FILTER
SERVICE PORT
PRESSURE SWITCH
PS
(28)
(23)
MIXING UNIT
(ACCUMULATOR)
CHECK VALVE
(14)
SOLENOID VALVE
LIQUID PIPE
HIGH AND LOW PRESSURE GAS PIPE(*1)
SUCTION GAS PIPE(*2)
*1: WHEN RQYQ140-180PY1, IT IS GAS PIPE.
*2: WHEN RQYQ140-180PY1, THIS PIPE IS NOT USED.

3D066010B

1.2 BS Unit

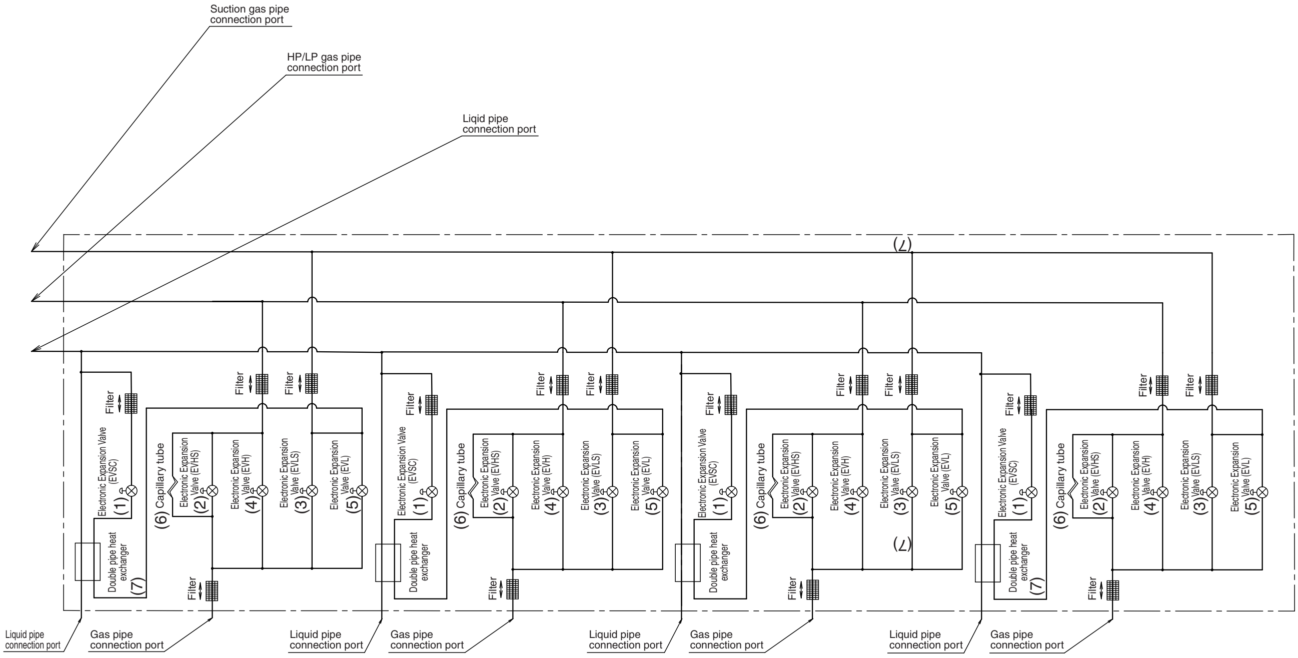
No.	Name	Symbol	Function
1	Electronic expansion valve (EVSC)	Y1E	In simultaneous cooling and heating operation, it is used to subcooling liquid refrigerants when an indoor unit downstream of this BS unit is in heating operation.
2	Electronic expansion valve (EVHS)	Y2E	Opens while in heating operation or all indoor units are in cooling operation.
3	Electronic expansion valve (EVLS)	Y3E	Opens while in cooling operation.
4	Electronic expansion valve (EVH)	Y4E	Opens while in heating operation or all indoor units are in cooling operation.
5	Electronic expansion valve (EVL)	Y5E	Opens while in cooling operation.
6	Capillary tube	—	Used to bypass high pressure gas to low pressure side to protect “Refrigerant accumulation” in high and low pressure gas pipes.
7	Double pipe heat exchanger	—	In simultaneous cooling and heating operation, it is used to subcooling liquid refrigerants when an indoor unit downstream of this BS unit is in heating operation.

• BSVQ100 ~ 250P



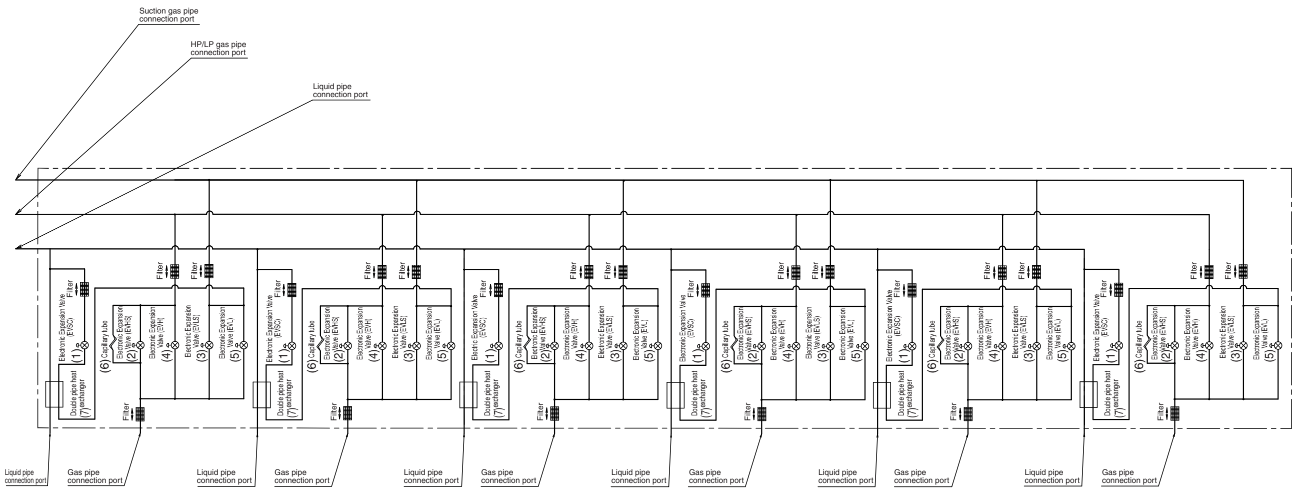
4D057985B

• **BSV4Q100P**



3D064148

• **BSV6Q100P**

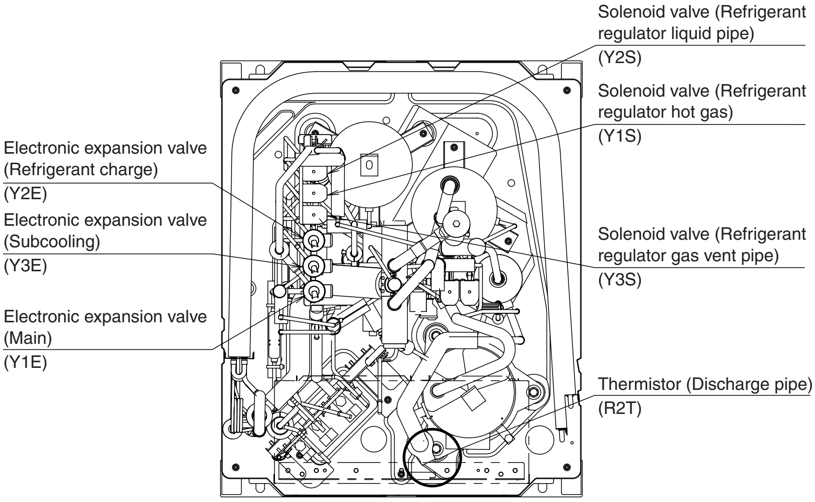


3D064149

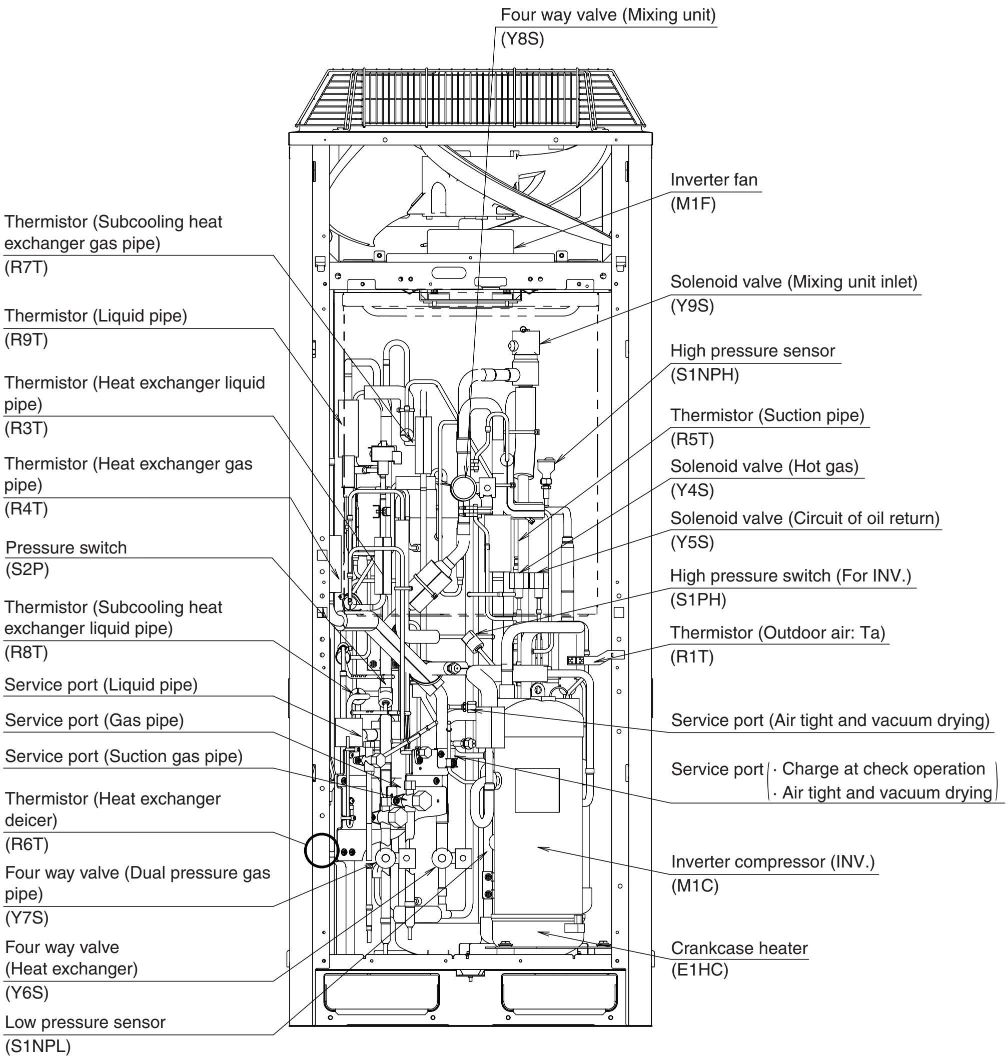
2. Functional Parts Layout

2.1 RQYQ140 · 180PY1, RQEQ140 ~ 212PY1

Plan



Front View

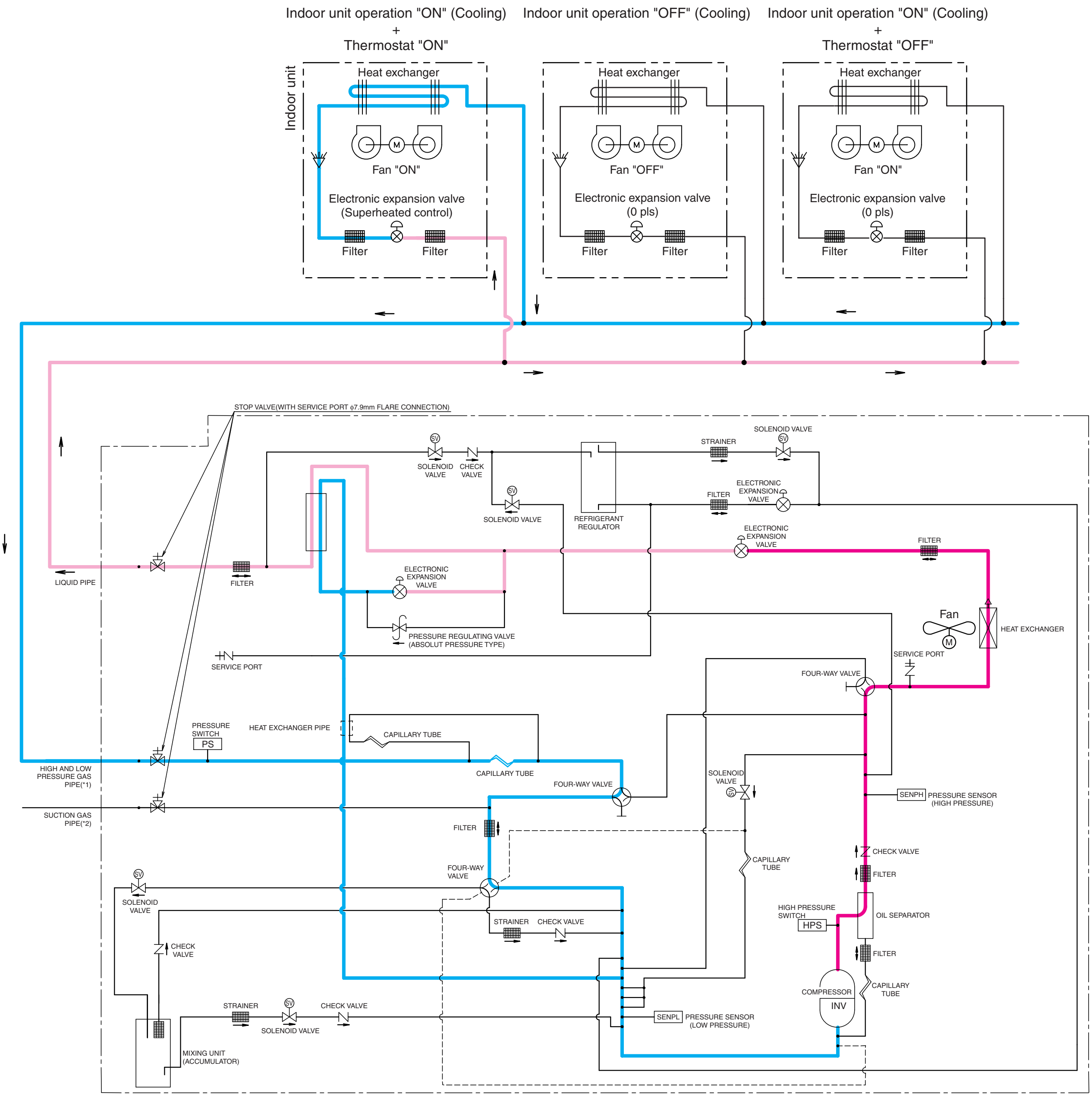


3. Refrigerant Flow for Each Operation Mode

3.1 RQYQ140 · 180PY1

Cooling operation

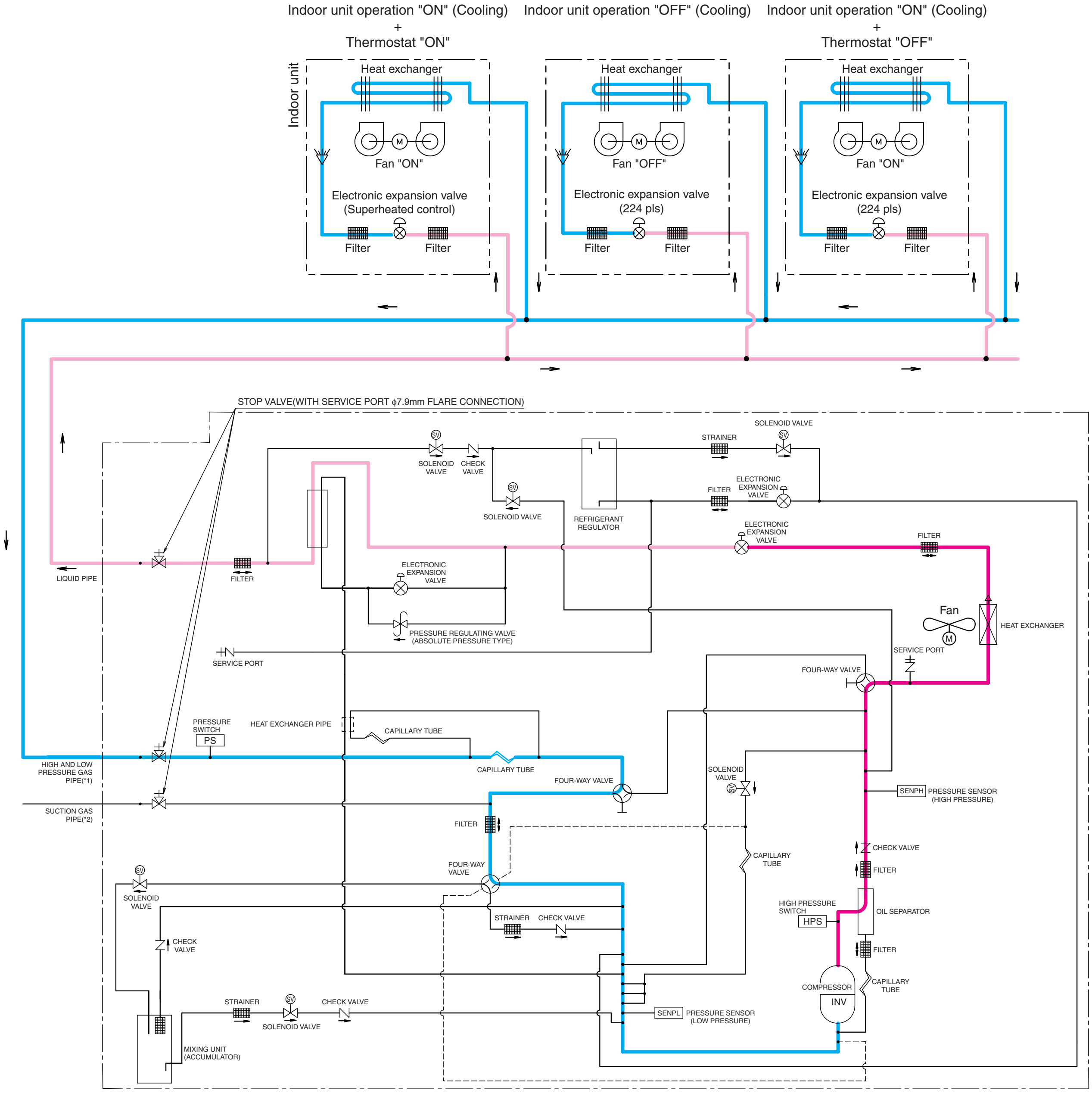
"High temperature, high pressure gas"
"High temperature, high pressure liquid"
"Low temperature, low pressure"



*1: WHEN RQYQ140·180PY1, IT IS GAS PIPE.
*2: WHEN RQYQ140·180PY1, THIS PIPE IS NOT USED.

Cooling oil return / Heating oil return / Defrost operation

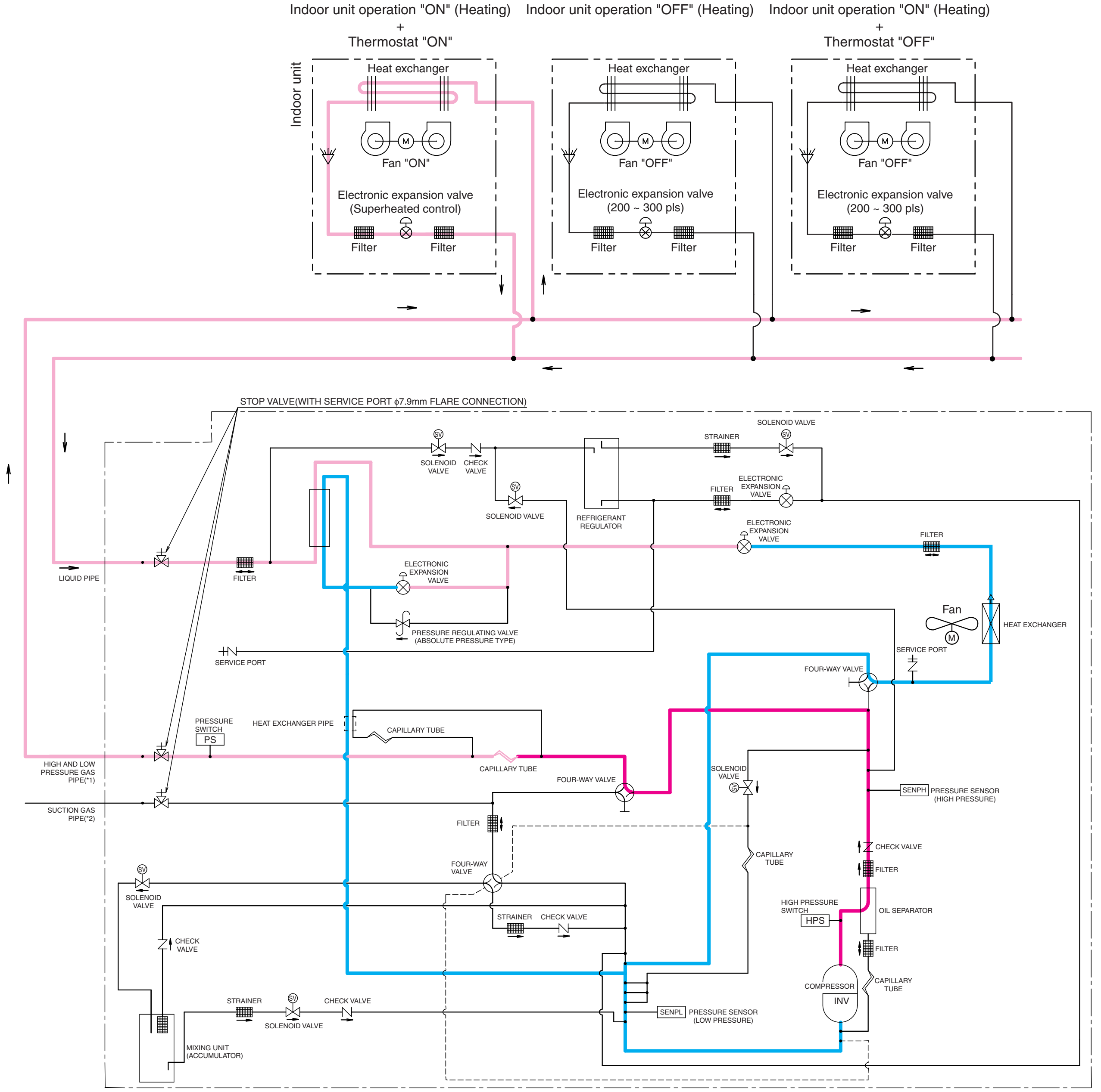
- "High temperature, high pressure gas"
- "High temperature, high pressure liquid"
- "Low temperature, low pressure"



*1: WHEN RQYQ140-180PY1, IT IS GAS PIPE.
*2: WHEN RQYQ140-180PY1, THIS PIPE IS NOT USED.

Heating operation

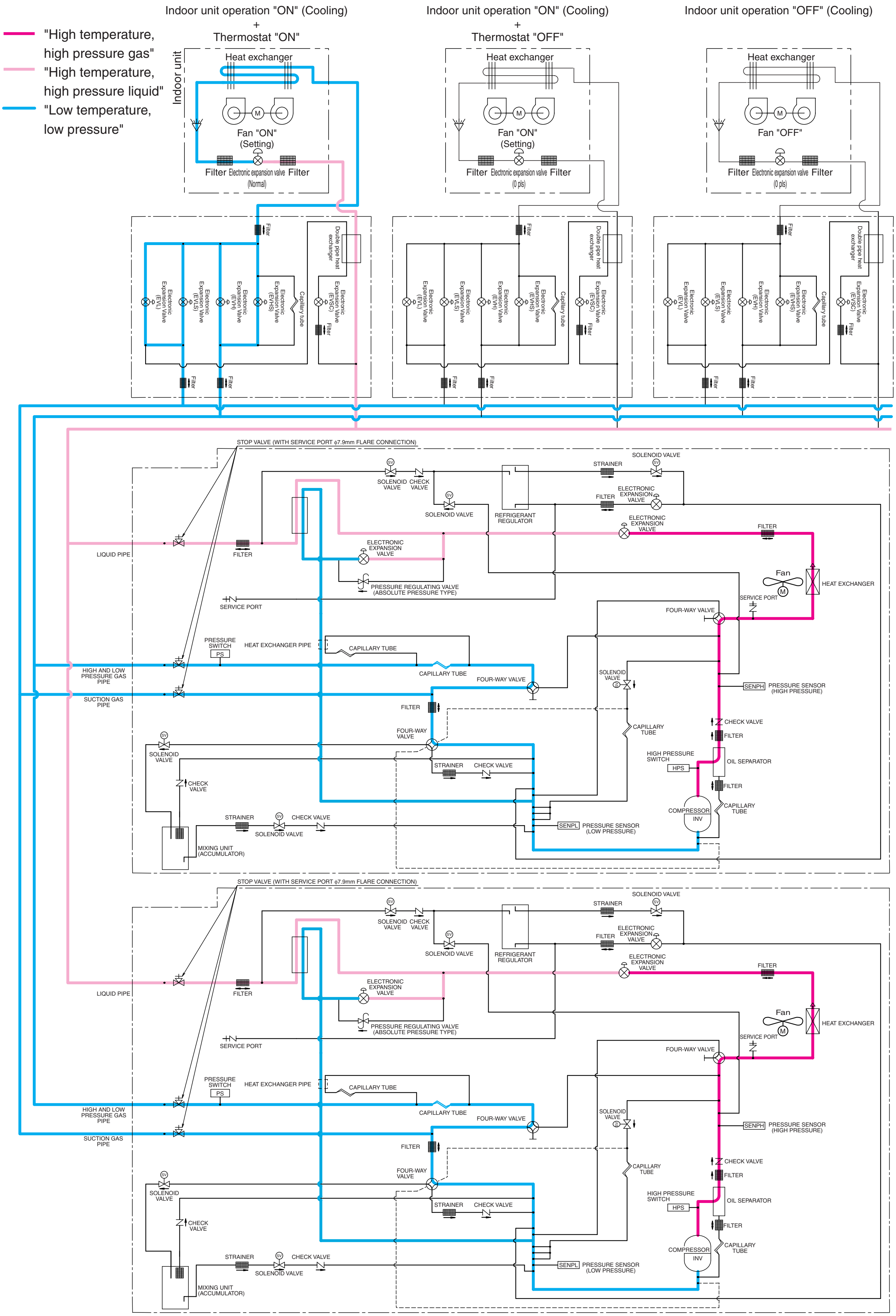
"High temperature, high pressure gas"
"High temperature, high pressure liquid"
"Low temperature, low pressure"



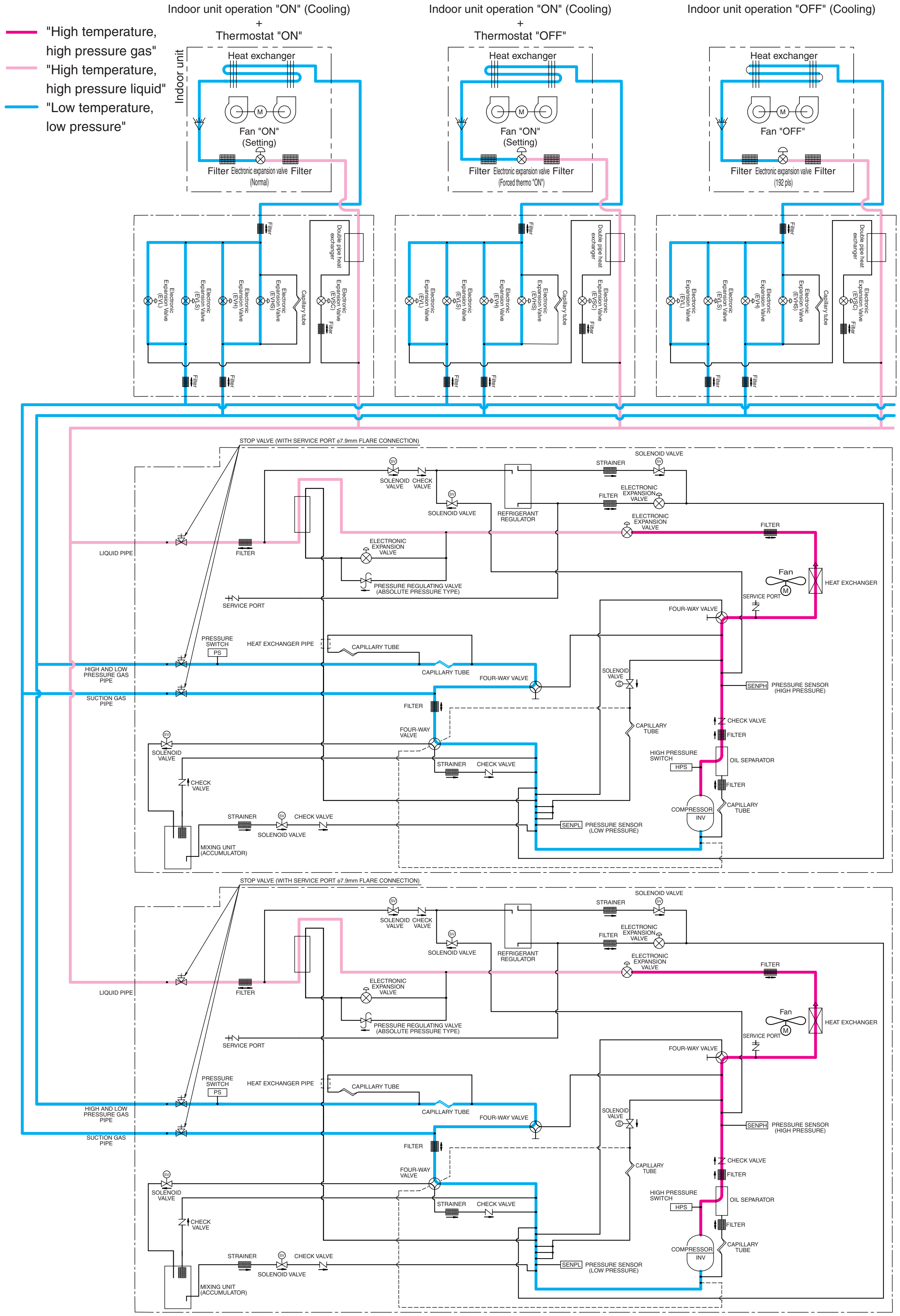
*1: WHEN RQYQ140·180PY1, IT IS GAS PIPE.
*2: WHEN RQYQ140·180PY1, THIS PIPE IS NOT USED.

3.2 RQCEQ280 ~ 848PY1

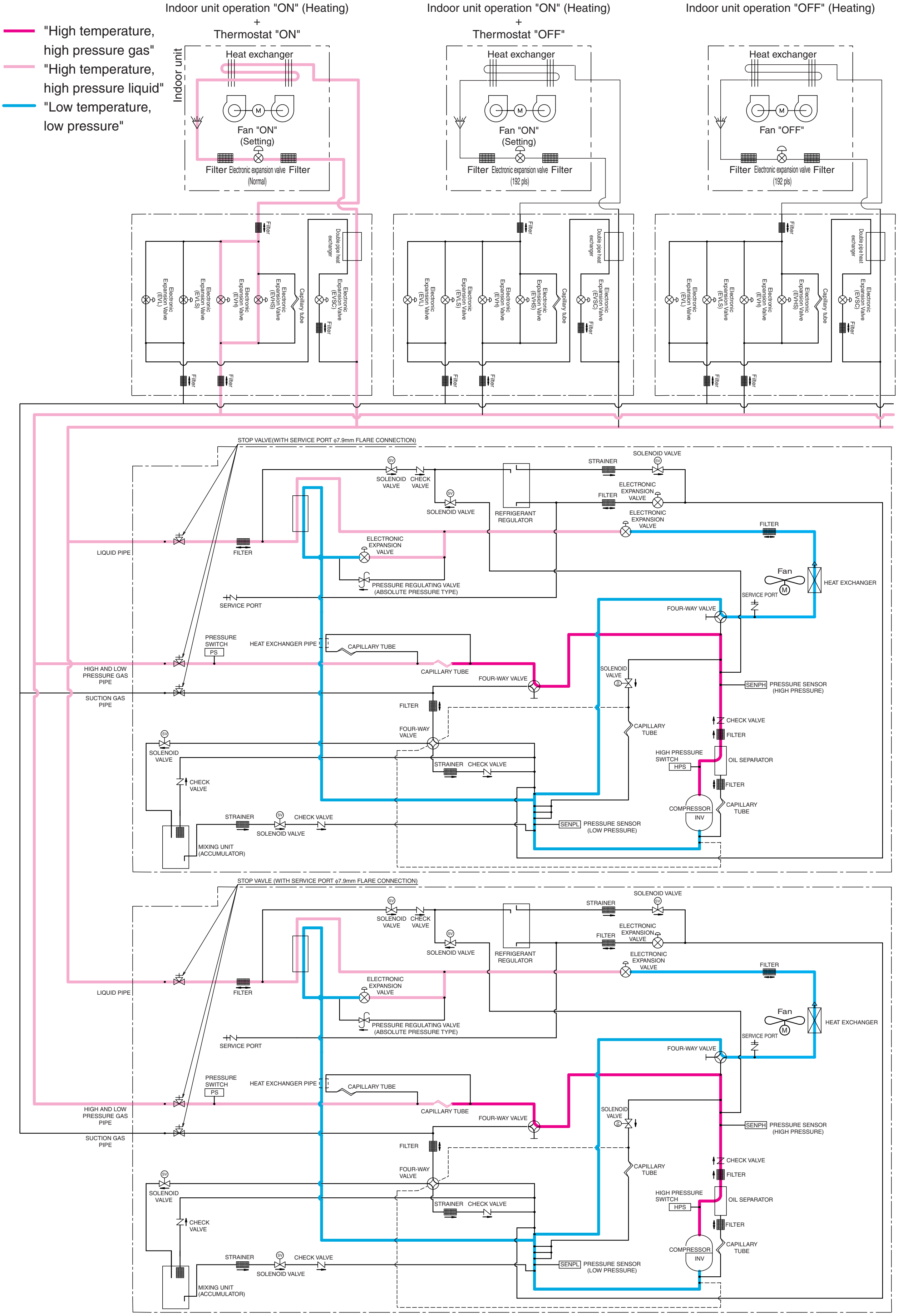
Cooling operation



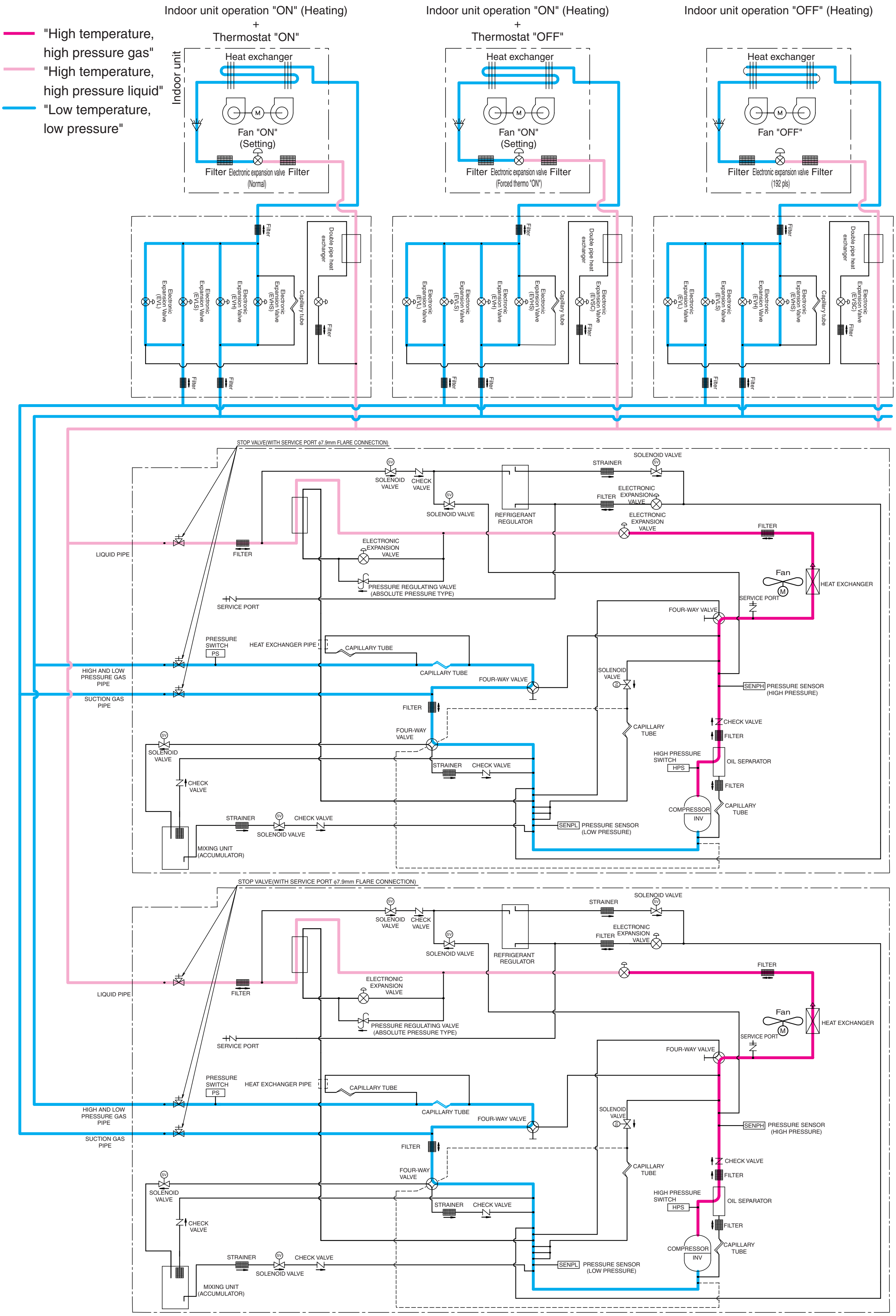
Cooling oil return operation



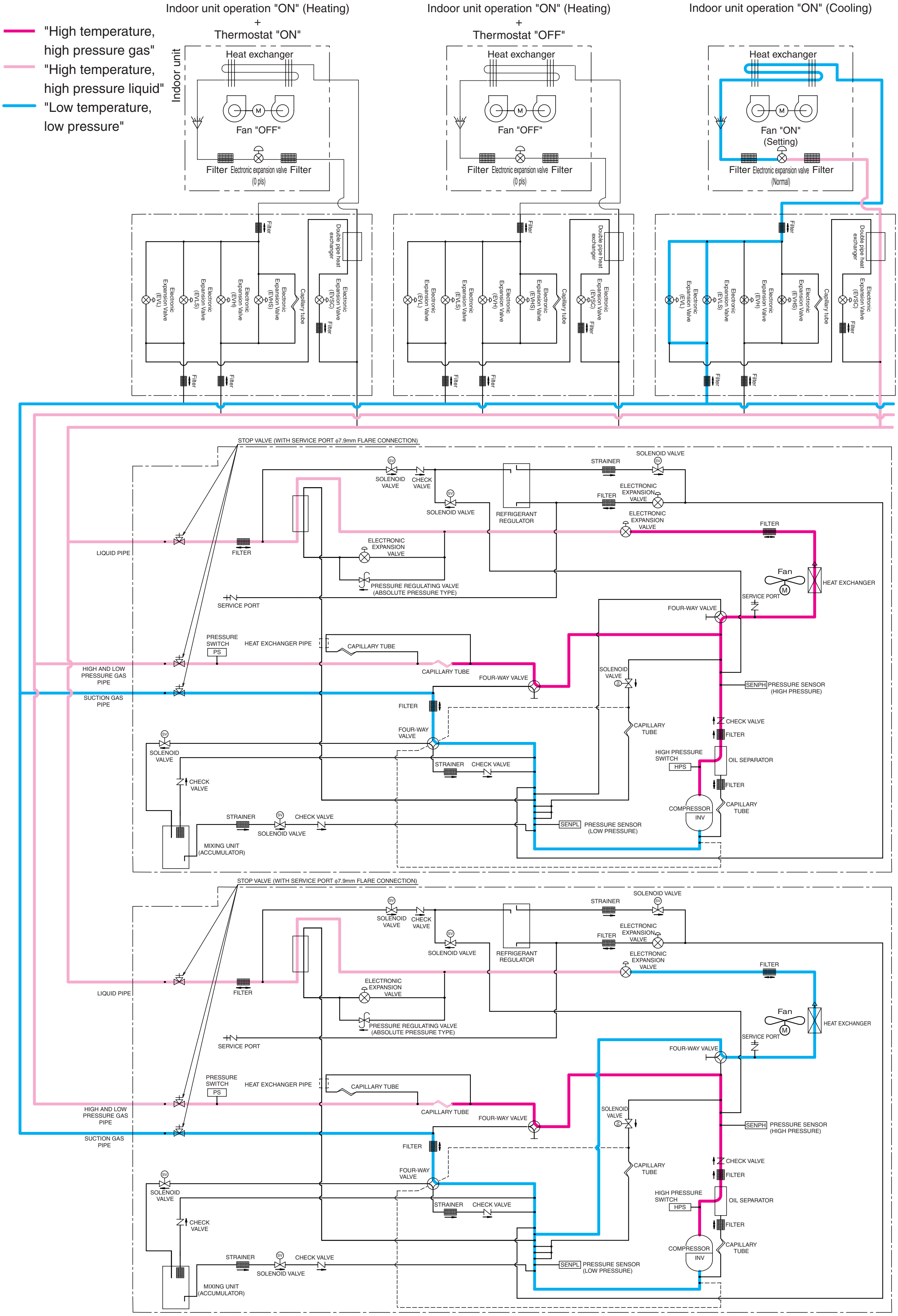
Heating operation



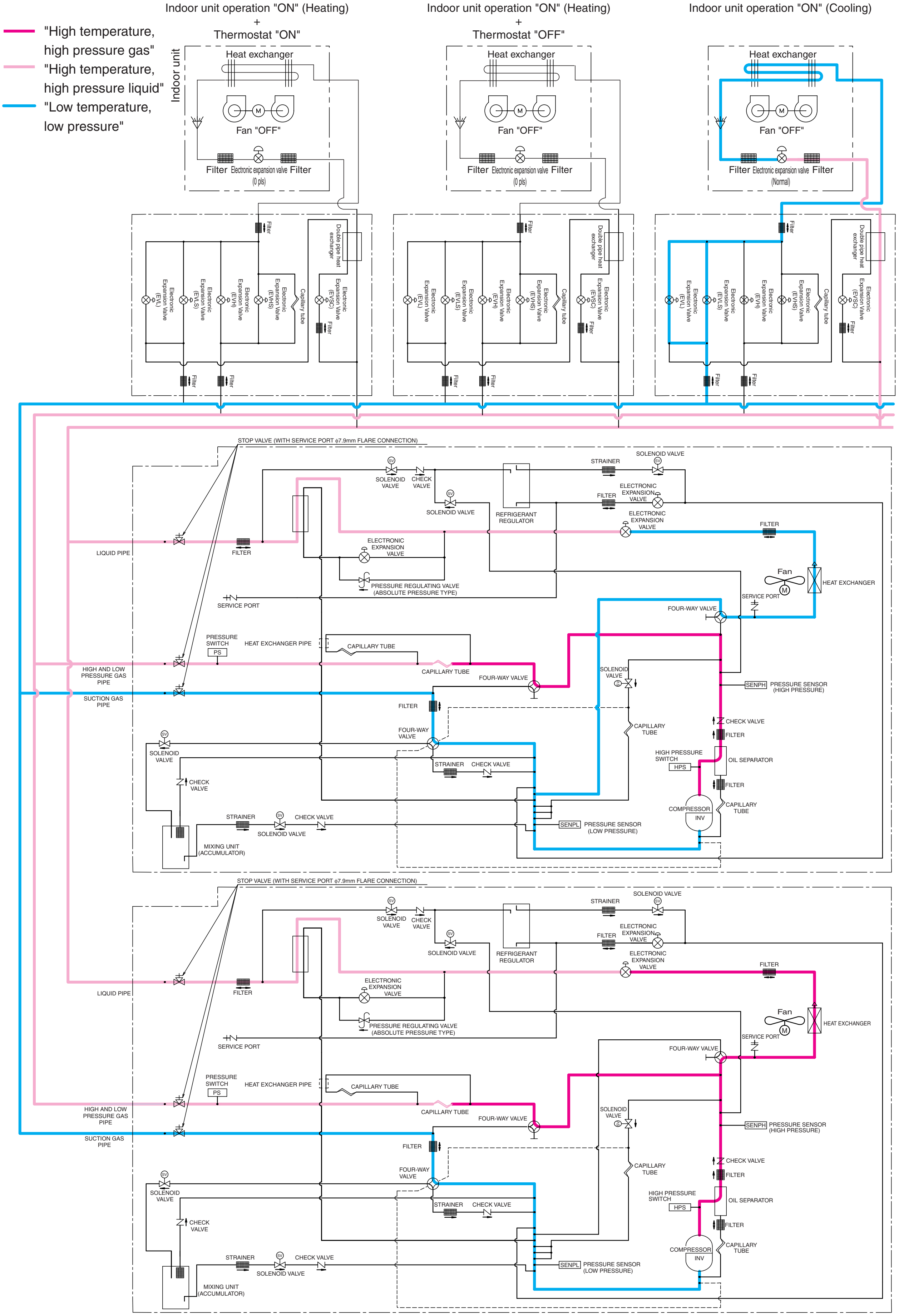
Heating oil return operation



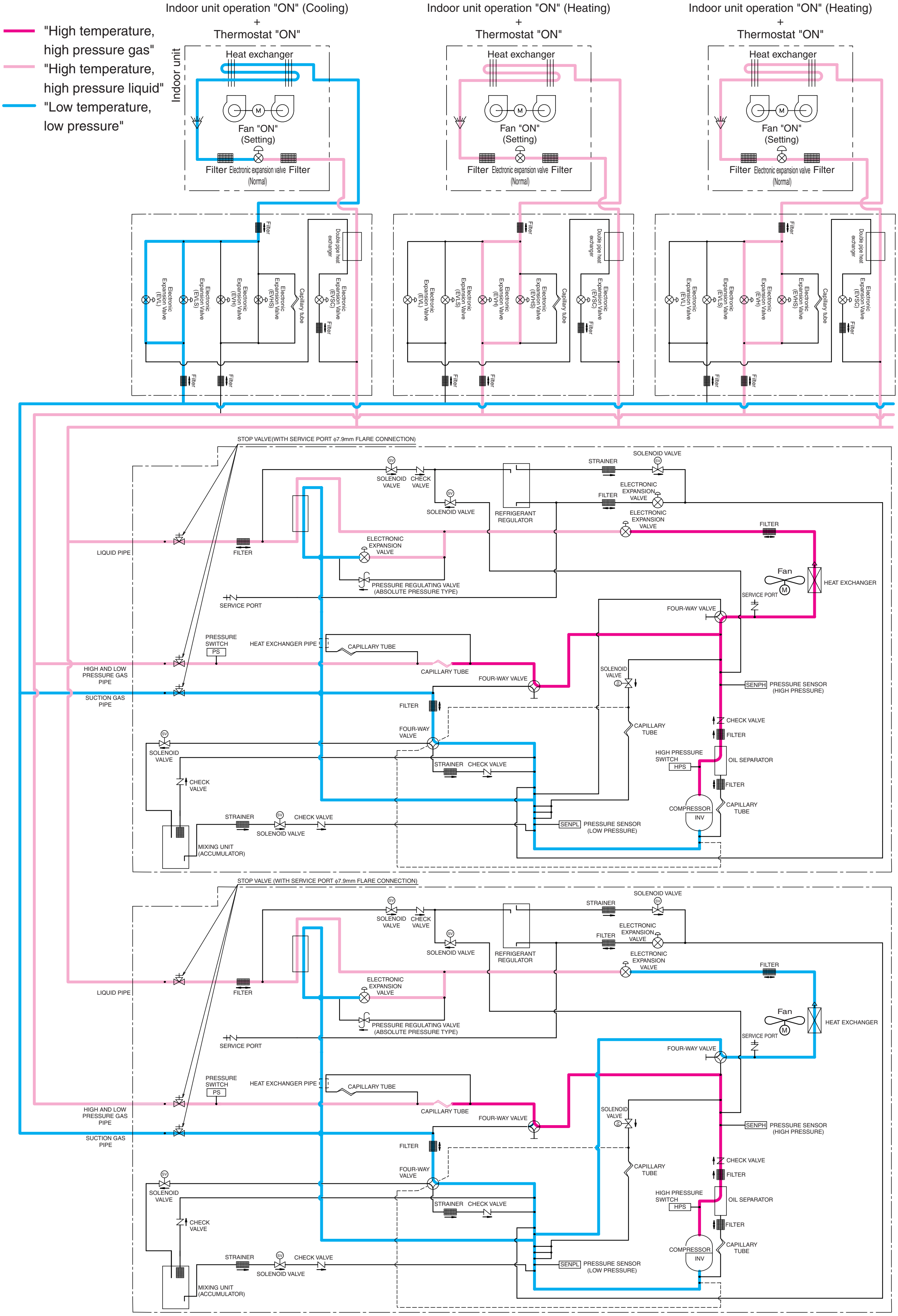
Defrost 1 operation



Defrost 2 operation



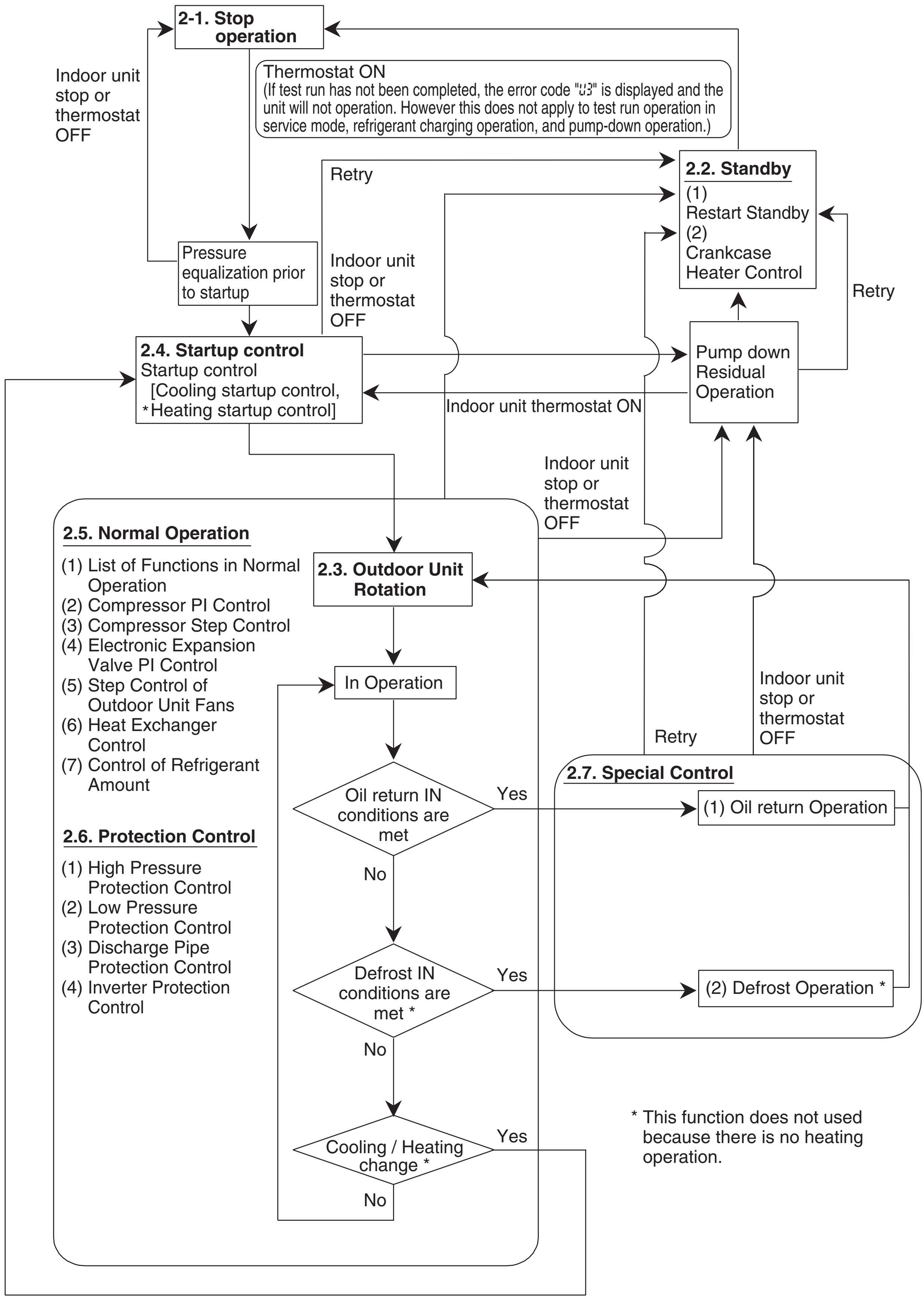
Simultaneous cooling / Heating operation



Part 4
Function

1. Function General

1.1 Operation Mode



1.2 Symbol

Symbol	Electric symbol	Description of function
20SA	Y6S	Four way valve (Heat exchanger switch)
20SB	Y7S	Four way valve (Dual pressure gas pipe switch)
	Y8S	Four way valve (Mixing unit)
DSH	—	Discharge pipe superheated degree
DSHi	—	Discharge pipe superheated degree of INV. compressor
DSHs	—	Discharge pipe superheated degree of STD compressor
EV	—	Opening of electronic expansion valve
EVJ	Y2E	Electronic expansion valve (Refrigerant charge)
EVM	Y1E	Electronic expansion valve (Main)
EVT	Y3E	Electronic expansion valve (Subcooling)
HTdi	—	Value of INV. compressor discharge pipe temperature compensated with outdoor air temperature
HTds	—	Value of STD compressor discharge pipe temperature compensated with outdoor air temperature
Pc	S1NPH	Value detected by high pressure sensor
Pe	S2NPL	Value detected by low pressure sensor
SH	—	Evaporator outlet superheated degree
SHS	—	Target evaporator outlet superheated degree
SVB	Y5S	Solenoid valve (Circuit of oil return)
SVG1	Y1S	Solenoid valve (Refrigerant regulator hot gas)
SVG2	Y3S	Solenoid valve (Refrigerant regulator gas vent pipe)
SVL	Y2S	Solenoid valve (Refrigerant regulator liquid pipe)
SVP	Y4S	Solenoid valve (Hot gas)
Ta	R1T	Outdoor air temperature
Tb	R4T	Heat exchanger outlet temperature at cooling
Tc	—	High pressure equivalent saturation temperature
TcS	—	Target temperature of Tc
Tdi	R31T	Discharge pipe temperature of INV. compressor
Tds	R32T, R33T	Discharge pipe temperature of STD compressor
Te	—	Low pressure equivalent saturation temperature
TeS	—	Target temperature of Te
Tf	R7T	Temperature of liquid pipe between outdoor unit heat exchanger and main electronic expansion valve
Tfin	R1T (A3P)	Radiation fin temperature
Tg	R4T	Heat exchanger gas pipe temperature
Tl	R6T	Temperature of liquid pipe between main electronic expansion valve and subcooling heat exchanger
TsA	R5T	Suction pipe temperature
Tsc	R9T	Temperature of liquid pipe
Tsh	R5T	Temperature of gas pipe detected with the subcooling heat exchanger outlet thermistor

2. Detailed Control Functions

2.1 Stop Operation

2.1.1 Stop due to Malfunction

In order to protect compressors, if any of the abnormal state occurs, the system will make "stop with thermostat OFF" and the malfunction will be determined according to the number of retry times.
(Refer to "Malfunction code list" (P.107~) of the troubleshooting for the items to determine the malfunction.)
∗ Operation to determine the malfunction: "Stop the system" and "malfunction code" is displayed on the remote controller.

2.1.2 When System is in Stop Mode

Stop both the master and slave units.
The four way valves both for heat exchanger switch and piping switch retain the condition before they were stopped.

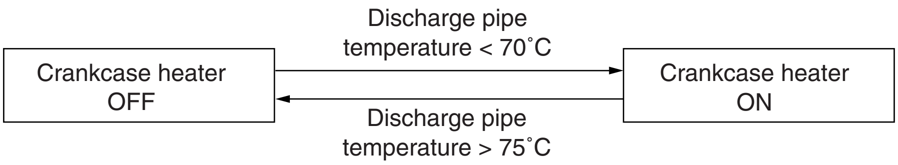
2.2 Standby

2.2.1 Restart Standby

Used to forcedly stop the compressor for a period of 3 minutes, in order to prevent the frequent ON/OFF of the compressor and equalize the pressure within the refrigerant system.
In addition, the outdoor fan carry out the residual operation for a while to suppress the acceleration of the pressure equalizing and melting of the refrigerant to the evaporator.

2.2.2 Crankcase Heater Control

In order to prevent the refrigerant from melting in the compressor oil in the stopped mode, this mode is used to control the crankcase heater.



2.3 Rotation Control

2.3.1 Outdoor Unit Rotation

In the case of multi-outdoor-unit system, this outdoor unit rotation is used to prevent the compressor from burning out due to unbalanced oil level between outdoor units.

[Timing of outdoor unit rotation]

· At the beginning of startup control

<System with two outdoor units>

	Outdoor Unit 1	Outdoor Unit 2
Previous time	Priority 1	Priority 2
This time	Priority 2	Priority 1
Next time	Priority 1	Priority 2

<System with three outdoor units>

	Outdoor Unit 1	Outdoor Unit 2	Outdoor Unit 3
Previous time	Priority 1	Priority 2	Priority 3
This time	Priority 3	Priority 1	Priority 2
Next time	Priority 2	Priority 3	Priority 1
One time after the next	Priority 1	Priority 2	Priority 3

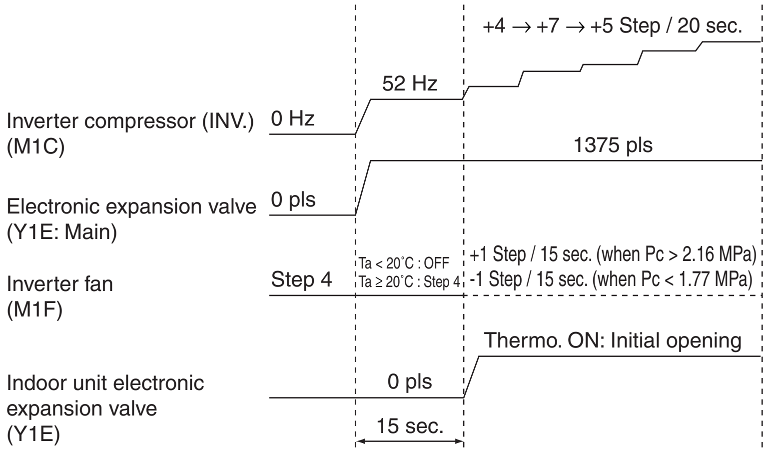
<System with four outdoor units>

	Outdoor Unit 1	Outdoor Unit 2	Outdoor Unit 3	Outdoor Unit 3
Previous time	Priority 1	Priority 2	Priority 3	Priority 4
This time	Priority 4	Priority 1	Priority 2	Priority 3
Next time	Priority 3	Priority 4	Priority 1	Priority 2
One time after the next	Priority 2	Priority 3	Priority 4	Priority 1
One time after the next plus one	Priority 1	Priority 2	Priority 3	Priority 4

2.4 Startup Control

This control is used to equalize the pressure in the front and back of the compressor prior to the startup of the compressor, thus reducing startup loads. Furthermore, the inverter is turned ON to charge the capacitor.
To avoid stresses to the compressor due to oil return or else after the startup, the following control is made and the position of the four way valve is also determined. Start both the master and the slave units simultaneously to position the four way valve.

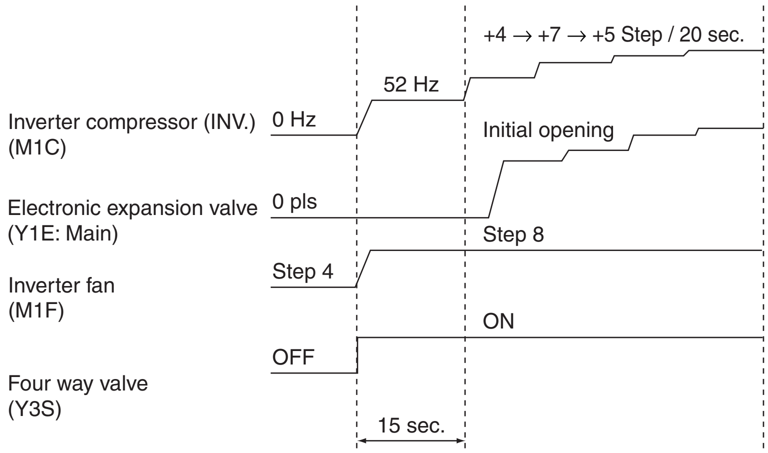
(1) Startup Control in Cooling Operation



[Ending conditions]

OR
- A lapse of 90 sec.
- Tc (high pressure equivalent saturation temperature) > 48°C
- Pc-Pe > 0.39MPa.

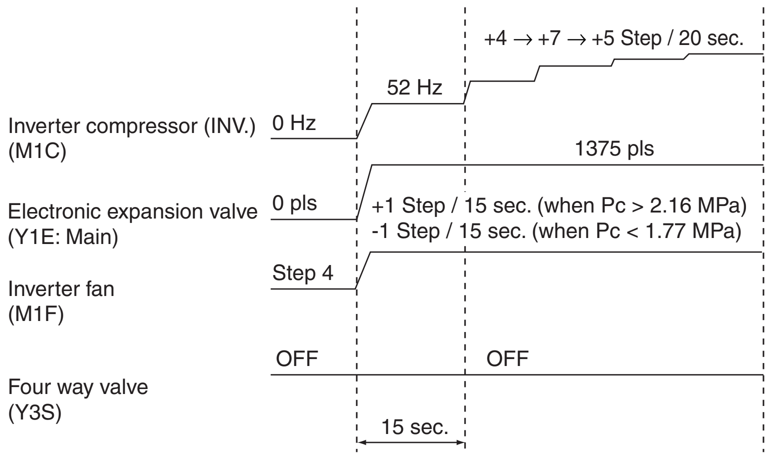
(2) Startup Control in Heating Operation (Outdoor unit heat exchanger = Evaporator)



[Ending conditions]

OR
- A lapse of 90 sec.
- Pc-Pe > 0.39MPa.

(3) Startup Control in Heating Operation (Outdoor unit heat exchanger = Condenser)



[Ending conditions]

OR
- A lapse of 90 sec.
- Pc-Pe > 0.39MPa.

2.5 Normal Operation

2.5.1 List of Functions in Normal Operation

<Outdoor Unit>

Part Name	Electric Symbol	Normal Cooling	Normal Heating	Normal Simultaneous Cooling / Heating
Compressor	M1C	PI control, High pressure protection, Low pressure protection, Td protection, INV protection	PI control, High pressure protection, Low pressure protection, Td protection, INV protection	PI control, High pressure protection, Low pressure protection, Td protection, INV protection
Outdoor unit fan	M1F	Cooling fan control	• Outdoor unit heat exchanger: Condenser / Cooling fan control • Outdoor unit heat exchanger: Evaporator / Fan step 7 or 8	• Outdoor unit heat exchanger: Condenser / Cooling fan control • Outdoor unit heat exchanger: Evaporator / Fan step 7 or 8
Electronic expansion valve (Main)	Y1E	480 pls	• Outdoor unit heat exchanger: Condenser / Liquid pressure control • Outdoor unit heat exchanger: Evaporator / PI control	• Outdoor unit heat exchanger: Condenser / Liquid pressure control • Outdoor unit heat exchanger: Evaporator / PI control
Electronic expansion valve (Subcooling)	Y3E	PI control	PI control	PI control
Electronic expansion valve (Refrigerant charge)	Y2E	41 pls for refrigerant discharge	41 pls for refrigerant discharge	41 pls for refrigerant discharge
Solenoid valve (Refrigerant regulator hot gas)	Y1S	ON for refrigerant discharge	ON for refrigerant discharge	ON for refrigerant discharge
Solenoid valve (Refrigerant regulator liquid pipe)	Y2S	ON for refrigerant recovery	ON for refrigerant recovery	ON for refrigerant recovery
Solenoid valve (Refrigerant regulator gas vent pipe)	Y3S	ON for refrigerant recovery	ON for refrigerant recovery	ON for refrigerant recovery
Solenoid valve (Hot gas)	Y4S	OFF	OFF	OFF
Solenoid valve (Circuit of oil return)	Y5S	ON	ON	ON
Four way valve (Heat exchanger switch)	Y6S	OFF	• Outdoor unit heat exchanger: Condenser / OFF • Outdoor unit heat exchanger: Evaporator / ON	• Outdoor unit heat exchanger: Condenser / OFF • Outdoor unit heat exchanger: Evaporator / ON
Four way valve (Dual pressure gas pipe)	Y7S	ON	OFF	OFF
Four way valve (Mixing unit)	Y8S	OFF	OFF	OFF
Solenoid valve (Mixing unit inlet)	Y9S	OFF	OFF	OFF

<Indoor Unit>

Part Name	Electric Symbol	Normal cooling			Normal heating		
		Thermostat ON unit	Thermostat OFF unit	Stopping unit	Thermostat ON unit	Thermostat OFF unit	Stopping unit
Indoor unit fan	M1F	Remote controller setting	Remote controller setting	OFF	Remote controller setting	LL	OFF
Electronic expansion valve (Main)	Y1E	Normal opening	0 pls	0 pls	Normal opening	192 pls	192 pls

<BS Unit>

Part Name	Electric Symbol	Normal cooling	Normal heating
Electronic expansion valve (EVSC)	Y1E	0 pls	0 pls
Electronic expansion valve (EVHS)	Y2E	480 pls (fully opened)	480 pls (fully opened)
Electronic expansion valve (EVLS)	Y3E	480 pls (fully opened)	0 pls
Electronic expansion valve (EVH)	Y4E	760 pls (fully opened)	760 pls (fully opened)
Electronic expansion valve (EVL)	Y5E	760 pls (fully opened)	0 pls

2.5.2 Compressor PI Control

Carries out the compressor capacity PI control to maintain Te at constant during cooling operation and Tc at constant during heating operation to ensure stable unit performance.

[Cooling operation]

Controls compressor capacity to adjust Te to achieve target value (TeS).
Te set value (Make this setting while in Setting mode 2.)

Te setting

L	M (Normal) (factory setting)	H				
3°C	6°C	7°C	8°C	9°C	10°C	11°C

Te : Low pressure equivalent saturation temperature (°C)
TeS : Target temperature of Te (Varies depending on Te setting, operating frequency, etc.)

* On multi-outdoor-unit systems, this control is made according to values of the first-priority unit, which is detected with the pressure sensor.

[Heating operation]

Controls compressor capacity to adjust Tc to achieve target value (TcS).
Tc set value (Make this setting while in Setting mode 2.)

Tc setting

L	M (Normal) (factory setting)	H
43°C	46°C	47°C

Tc : High pressure equivalent saturation temperature (°C)
TcS : Target temperature of Tc (Varies depending on Tc setting, operating frequency, etc.)

* On multi-outdoor-unit systems, this control is made according to values of the first-priority unit, which is detected with the pressure sensor.

2.5.3 Compressor Step Control

Compressor operations vary with the following steps according to information in “2.5.2 Compressor PI Control”.

RQYQ140 · 180PY1

STEP No.	INV.	
1	52Hz	← Initial step
2	56Hz	
3	62Hz	
4	68Hz	
5	74Hz	
6	80Hz	
7	88Hz	
8	96Hz	
9	104Hz	
10	110Hz	
11	116Hz	
12	124Hz	
13	132Hz	
14	144Hz	
15	158Hz	
16	166Hz	
17	176Hz	
18	188Hz	
19	202Hz	
20	210Hz	*1
21	218Hz	
22	232Hz	
23	248Hz	*2

*1: Upper limit of Q140 type is 20.
*2: Upper limit of Q180 type is 23.

RQCYQ280 · 360PY1
RQCEQ280 · 360PY1

STEP No.	Master INV.	Slave INV.	
1	52Hz	OFF	
2	56Hz	OFF	
3	62Hz	OFF	
4	68Hz	OFF	
5	74Hz	OFF	
6	80Hz	OFF	
7	88Hz	OFF	
8	96Hz	OFF	
9	104Hz	OFF	←
10	110Hz	OFF	
11	116Hz	OFF	
12	124Hz	OFF	
13	132Hz	OFF	
14	144Hz	OFF	→

STEP No.	Master INV.	Slave INV.	
1	52Hz	52Hz	← Initial step
2	56Hz	56Hz	
3	62Hz	62Hz	
4	66Hz	66Hz	
5	70Hz	70Hz	
6	74Hz	74Hz	
7	80Hz	80Hz	
8	88Hz	88Hz	
9	92Hz	92Hz	
10	96Hz	96Hz	
11	104Hz	104Hz	
12	110Hz	110Hz	
13	116Hz	116Hz	
14	124Hz	124Hz	
15	132Hz	132Hz	
16	144Hz	144Hz	
17	158Hz	158Hz	
18	166Hz	166Hz	
19	176Hz	176Hz	
20	188Hz	188Hz	
21	202Hz	202Hz	
22	210Hz	210Hz	*1
23	218Hz	218Hz	
24	232Hz	232Hz	
25	248Hz	248Hz	*2

*1: Upper limit of Q140 type is 22.
*2: Upper limit of Q180 type is 25.

RQCYQ460 ~ 540PY1
RQCEQ460 ~ 636PY1

STEP No.	Master INV.	Slave 1 INV.	Slave 2 INV.	
1	52Hz	OFF	OFF	
2	56Hz	OFF	OFF	
3	62Hz	OFF	OFF	
4	68Hz	OFF	OFF	
5	74Hz	OFF	OFF	
6	80Hz	OFF	OFF	
7	88Hz	OFF	OFF	
8	96Hz	OFF	OFF	
9	104Hz	OFF	OFF	← (from step 1 of next table)
10	110Hz	OFF	OFF	
11	116Hz	OFF	OFF	
12	124Hz	OFF	OFF	
13	132Hz	OFF	OFF	
14	144Hz	OFF	OFF	→ (to step 6 of next table)

1	52Hz	52Hz	OFF	
2	56Hz	56Hz	OFF	
3	62Hz	62Hz	OFF	
4	66Hz	66Hz	OFF	
5	70Hz	70Hz	OFF	
6	74Hz	74Hz	OFF	← (from step 1 of next table)
7	80Hz	80Hz	OFF	
8	88Hz	88Hz	OFF	
9	92Hz	92Hz	OFF	
10	96Hz	96Hz	OFF	
11	104Hz	104Hz	OFF	
12	110Hz	110Hz	OFF	
13	116Hz	116Hz	OFF	→ (to step 8 of next table)

1	52Hz	52Hz	52Hz	← Initial step
2	56Hz	56Hz	56Hz	
3	62Hz	62Hz	62Hz	
4	66Hz	66Hz	66Hz	
5	68Hz	68Hz	68Hz	
6	70Hz	70Hz	70Hz	
7	74Hz	74Hz	74Hz	
8	80Hz	80Hz	80Hz	
9	88Hz	88Hz	88Hz	
10	96Hz	96Hz	96Hz	
11	104Hz	104Hz	104Hz	
12	110Hz	110Hz	110Hz	
13	116Hz	116Hz	116Hz	
14	124Hz	124Hz	124Hz	
15	132Hz	132Hz	132Hz	
16	138Hz	138Hz	138Hz	
17	144Hz	144Hz	144Hz	
18	158Hz	158Hz	158Hz	
19	166Hz	166Hz	166Hz	
20	176Hz	176Hz	176Hz	
21	188Hz	188Hz	188Hz	
22	202Hz	202Hz	202Hz	
23	210Hz	210Hz	210Hz	*1
24	218Hz	218Hz	218Hz	
25	232Hz	232Hz	232Hz	
26	248Hz	248Hz	248Hz	*2
27	266Hz	266Hz	266Hz	*3

*1: Upper limit of Q140 type is 23.
*2: Upper limit of Q180 type is 26.
*3: Upper limit of Q212 type is 27.

RQCEQ712 ~ 848PY1

STEP No.	Master INV.	Slave 1 INV.	Slave 2 INV.	Slave 3 INV.	
1	52Hz	OFF	OFF	OFF	
2	56Hz	OFF	OFF	OFF	
3	62Hz	OFF	OFF	OFF	
4	68Hz	OFF	OFF	OFF	
5	74Hz	OFF	OFF	OFF	
6	80Hz	OFF	OFF	OFF	
7	88Hz	OFF	OFF	OFF	
8	96Hz	OFF	OFF	OFF	
9	104Hz	OFF	OFF	OFF	←
10	110Hz	OFF	OFF	OFF	
11	116Hz	OFF	OFF	OFF	
12	124Hz	OFF	OFF	OFF	
13	132Hz	OFF	OFF	OFF	
14	144Hz	OFF	OFF	OFF	→

1	52Hz	52Hz	OFF	OFF	
2	56Hz	56Hz	OFF	OFF	
3	62Hz	62Hz	OFF	OFF	
4	66Hz	66Hz	OFF	OFF	
5	70Hz	70Hz	OFF	OFF	
6	74Hz	74Hz	OFF	OFF	←
7	80Hz	80Hz	OFF	OFF	
8	88Hz	88Hz	OFF	OFF	
9	92Hz	92Hz	OFF	OFF	
10	96Hz	96Hz	OFF	OFF	
11	104Hz	104Hz	OFF	OFF	
12	110Hz	110Hz	OFF	OFF	
13	116Hz	116Hz	OFF	OFF	→

1	52Hz	52Hz	52Hz	OFF	
2	56Hz	56Hz	56Hz	OFF	
3	62Hz	62Hz	62Hz	OFF	
4	66Hz	66Hz	66Hz	OFF	
5	68Hz	68Hz	68Hz	OFF	←
6	70Hz	70Hz	70Hz	OFF	
7	74Hz	74Hz	74Hz	OFF	
8	80Hz	80Hz	80Hz	OFF	
9	88Hz	88Hz	88Hz	OFF	
10	96Hz	96Hz	96Hz	OFF	
11	104Hz	104Hz	104Hz	OFF	
12	110Hz	110Hz	110Hz	OFF	
13	116Hz	116Hz	116Hz	OFF	
14	124Hz	124Hz	124Hz	OFF	→

1	52Hz	52Hz	52Hz	52Hz	← Initial step
2	56Hz	56Hz	56Hz	56Hz	
3	62Hz	62Hz	62Hz	62Hz	
4	66Hz	66Hz	66Hz	66Hz	
5	68Hz	68Hz	68Hz	68Hz	
6	70Hz	70Hz	70Hz	70Hz	
7	74Hz	74Hz	74Hz	74Hz	
8	80Hz	80Hz	80Hz	80Hz	
9	88Hz	88Hz	88Hz	88Hz	
10	96Hz	96Hz	96Hz	96Hz	
11	104Hz	104Hz	104Hz	104Hz	
12	110Hz	110Hz	110Hz	110Hz	
13	116Hz	116Hz	116Hz	116Hz	
14	124Hz	124Hz	124Hz	124Hz	
15	132Hz	132Hz	132Hz	132Hz	
16	138Hz	138Hz	138Hz	138Hz	
17	144Hz	144Hz	144Hz	144Hz	
18	158Hz	158Hz	158Hz	158Hz	
19	166Hz	166Hz	166Hz	166Hz	
20	176Hz	176Hz	176Hz	176Hz	
21	188Hz	188Hz	188Hz	188Hz	
22	202Hz	202Hz	202Hz	202Hz	
23	210Hz	210Hz	210Hz	210Hz	*1
24	218Hz	218Hz	218Hz	218Hz	
25	232Hz	232Hz	232Hz	232Hz	
26	248Hz	248Hz	248Hz	248Hz	*2
27	266Hz	266Hz	266Hz	266Hz	*3

*1: Upper limit of Q140 type is 23.
*2: Upper limit of Q180 type is 26.
*3: Upper limit of Q212 type is 27.

2.5.4 Electronic Expansion Valve PI Control

Main electronic expansion valve EVM control

When the outdoor unit heat exchanging is performed via the evaporator (20SA is set to ON), this function is used to exert PI control on the electronic expansion valve (Y1E) so that the evaporator outlet superheated degree (SH) will become constant.

SH = Tg - Te

SH: Evaporator outlet superheated degree (°C)
Tg : Suction pipe temperature (°C) detected by the heat exchanger gas pipe thermistor R4T.
Te : Low pressure equivalent saturation temperature (°C)

Subcooling electronic expansion valve EVT control

In order to make the maximum use of the subcooling heat exchanger, this function is used to exert PI control on the electronic expansion valve (Y3E) so that the evaporator-side gas pipe superheated degree (SH) will become constant.

SH = Tsh - Te

SH: Outlet superheated degree of evaporator (°C)
Tsh: Suction pipe temperature (°C) detected by the subcooling heat exchanger outlet thermistor R7T
Te: Low pressure equivalent saturation temperature (°C)

Refrigerant charge electronic expansion valve EVJ control

While in automatic refrigerant charge mode or additional refrigerant charge mode, this function is used to exert PI control on the opening degree of the electronic expansion valve (Y2E) in response to outdoor temperature and close the valve after the completion of refrigerant charge. For normal operation, this electronic expansion valve is set to “41 pls”.

2.5.5 Step Control of Outdoor Unit Fans

[Step control of fans]

Used to control the revolutions of outdoor unit fans in the steps listed in table below, according to condition changes.

STEP No.	Fan revolutions (rpm)		
	RQYQ140PY1 RQEQ140PY1	RQYQ180PY1 RQEQ180PY1	RQEQ212PY1
1	285	285	285
2	315	315	315
3	360	360	360
4	450	450	450
5	570	570	570
6	710	710	710
7	830	855	855
8	Cooling: 951 Heating: 941	1100	1100

* Figures listed above are all those controlled while in standard mode, which vary when the system is set to high static pressure or capacity precedence mode.

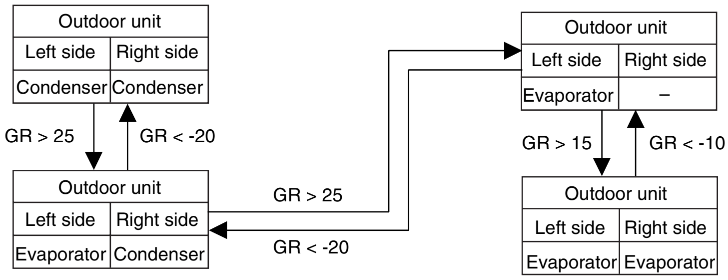
[Control at a low outdoor air temperature during cooling]

Secure the liquid pressure and circulating rate in the indoor unit through high pressure control with the outdoor fan when the outdoor air temperature is low during cooling. Control the fan with the target Tc (high pressure equivalent saturation temperature) = 34°C

2.5.6 Heat Exchanger Control

While in heating or cool/heat simultaneous operation, ensure target condensing and evaporating temperature by changing over the air heat exchanger of outdoor unit to the evaporator or the condenser in response to loads.

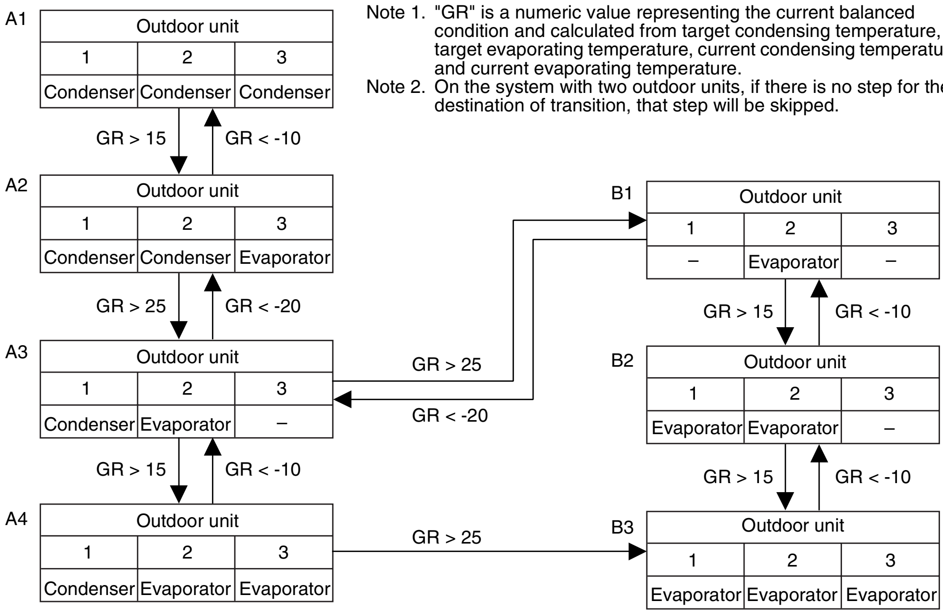
[Single system]



Note 1. "GR" is a numeric value representing the current balanced condition and calculated from target condensing temperature, target evaporating temperature, current condensing temperature, and current evaporating temperature.

[Multi outdoor unit system]

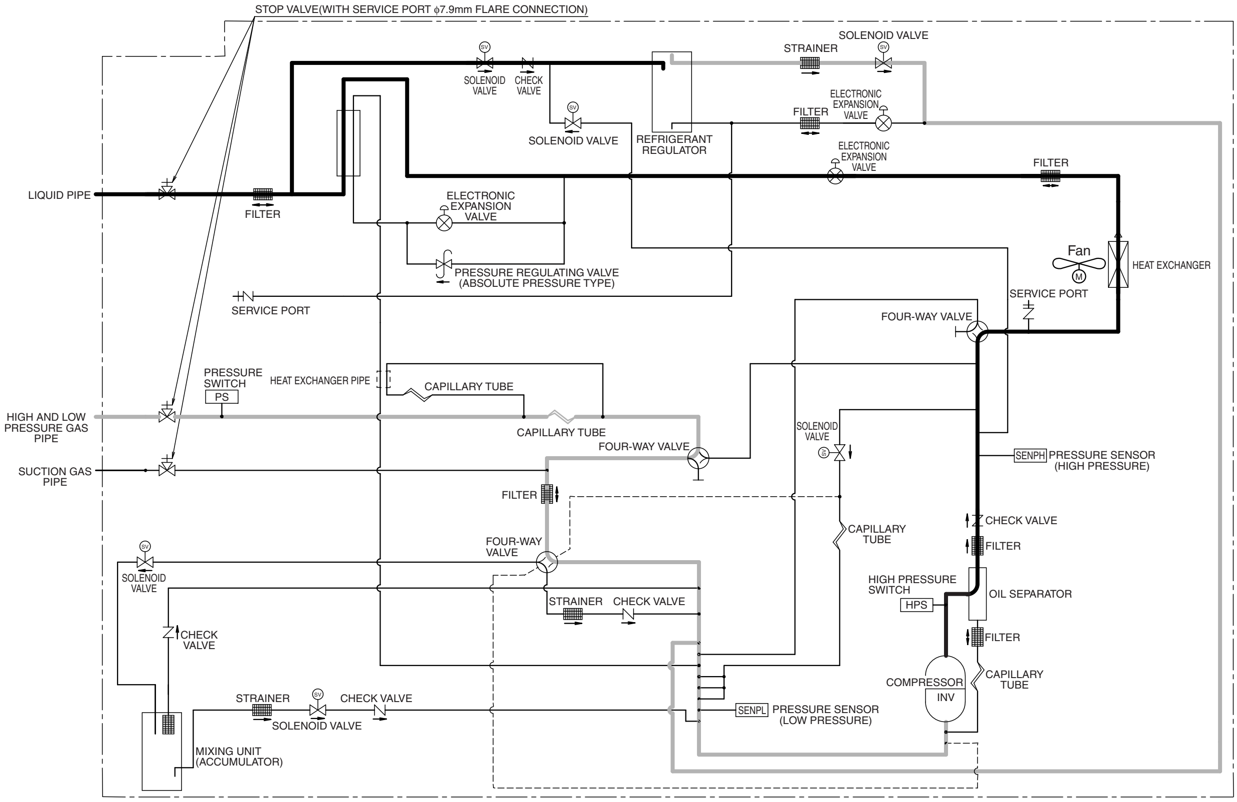
Note 1. "GR" is a numeric value representing the current balanced condition and calculated from target condensing temperature, target evaporating temperature, current condensing temperature, and current evaporating temperature.
Note 2. On the system with two outdoor units, if there is no step for the destination of transition, that step will be skipped.



2.5.7 Control of Refrigerant Amount

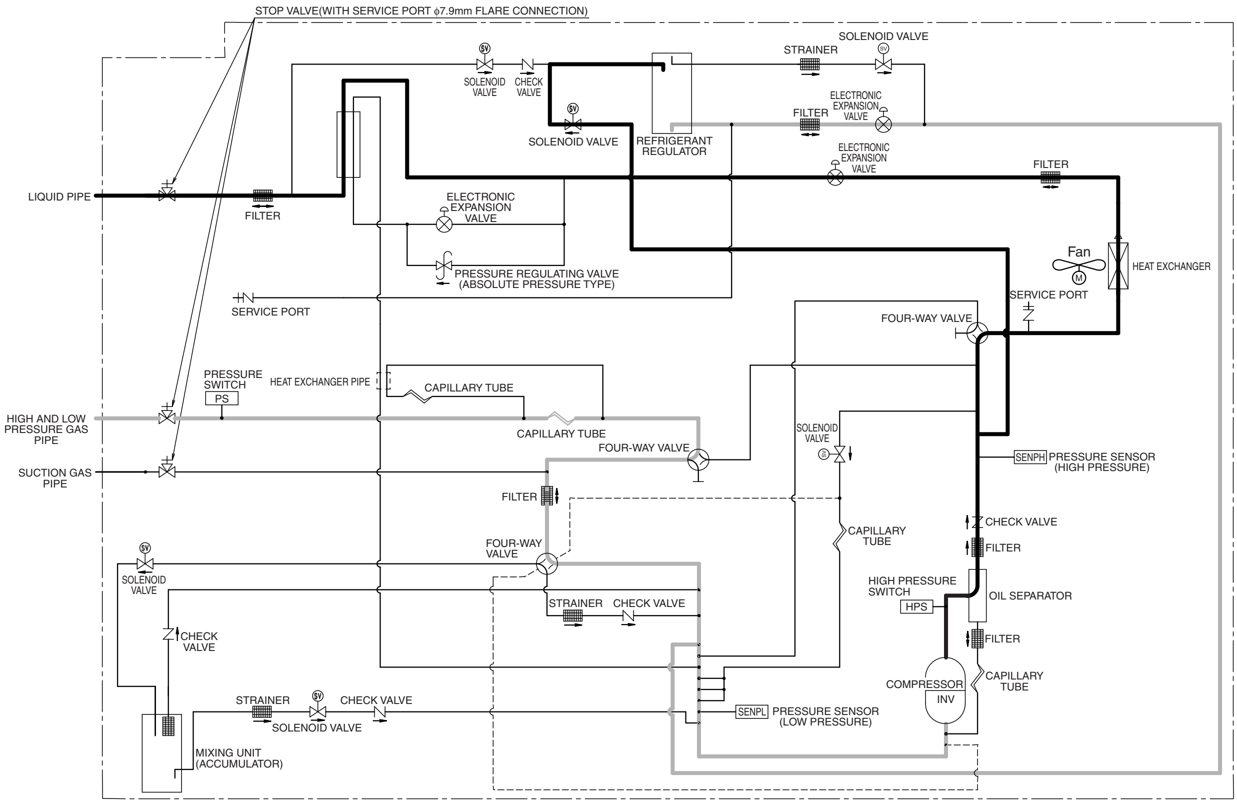
<Recovery of refrigerant>

Open the solenoid valve (Y2S, Y3S) when the load of the indoor unit is low and return the surplus refrigerant to the refrigerant regulator.



<Discharge of refrigerant>

Open the solenoid valve (Y1S) and the electronic expansion valve (Y2E) when the load of the indoor unit is high and discharge the refrigerant from the refrigerant regulator.



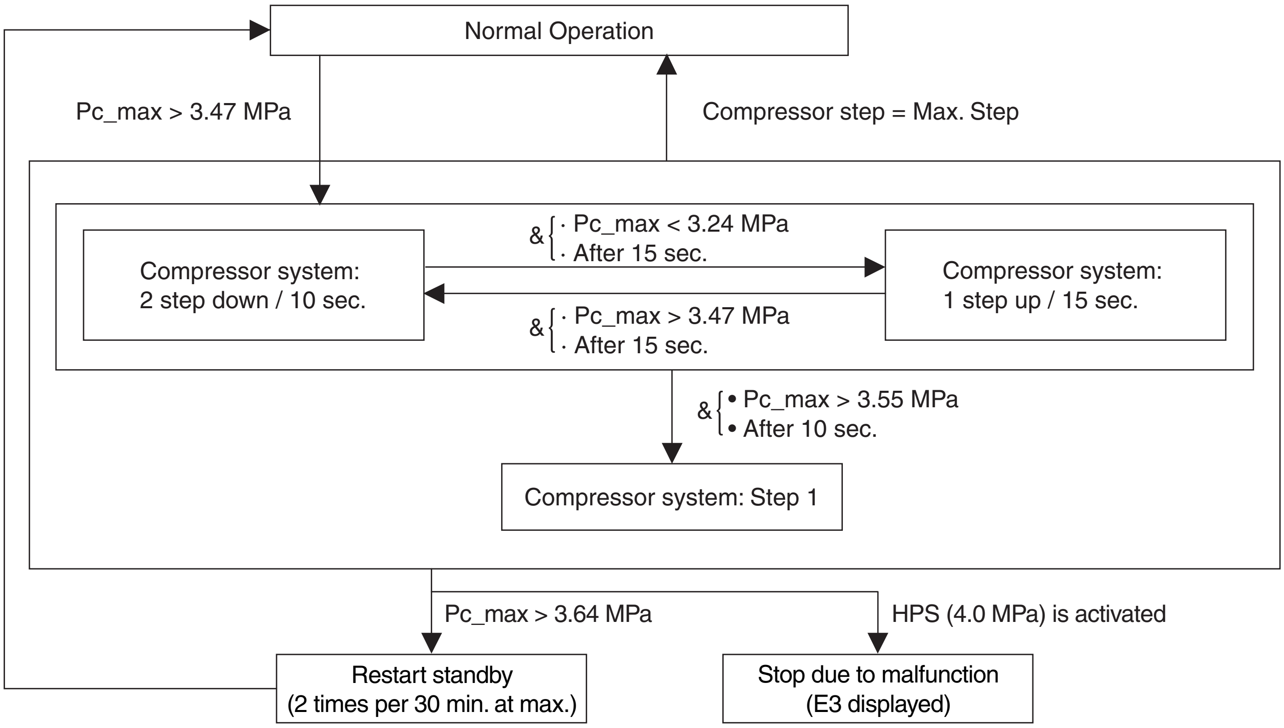
2.6 Protection Control

2.6.1 High Pressure Protection Control

This high pressure protection control is used to prevent the activation of protection devices due to abnormal increase of high pressure and to protect compressors against the transient increase of high pressure.

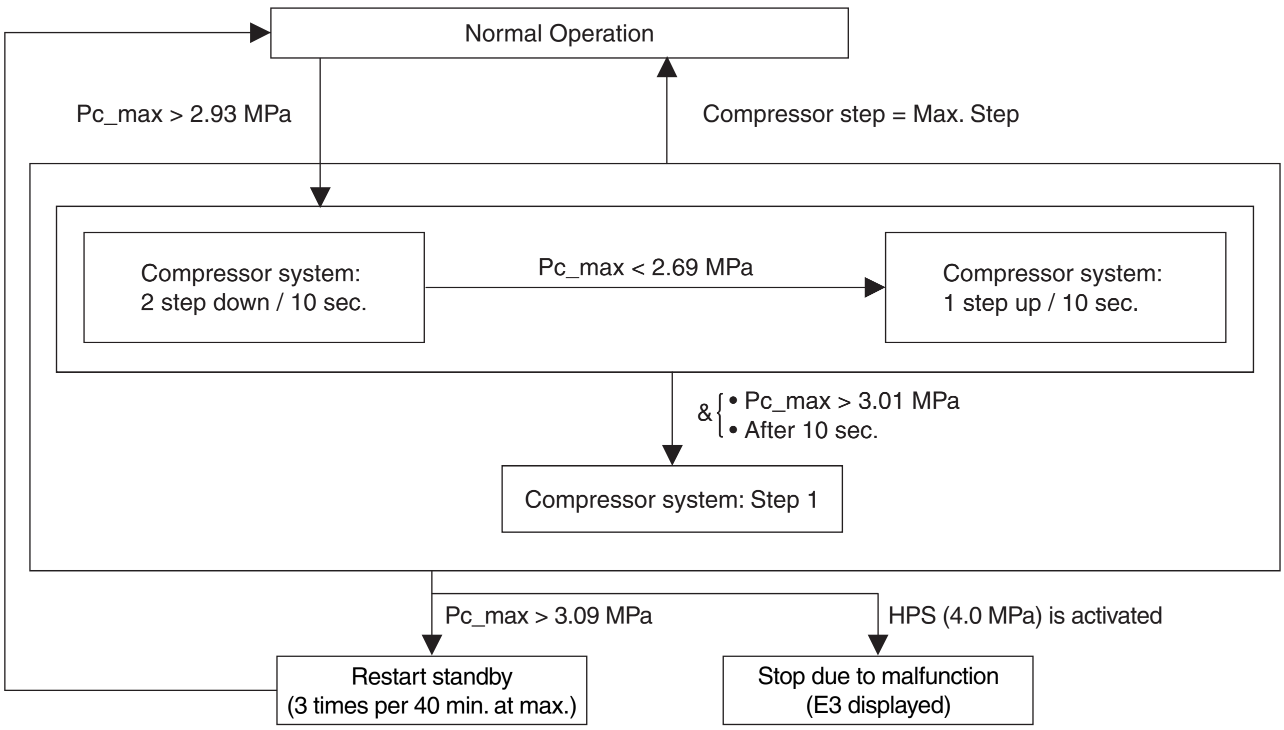
[In cooling operation]

★ In case of multi-outdoor-unit system, the following control is performed in the entire system.
Pc_max indicates the maximum value within the system.



[Heating Operation and Simultaneous Cooling / Heating Operation]

★ In case of multi-outdoor-unit system, the following control is performed in the entire system.
Pc_max indicates the maximum value within the system.

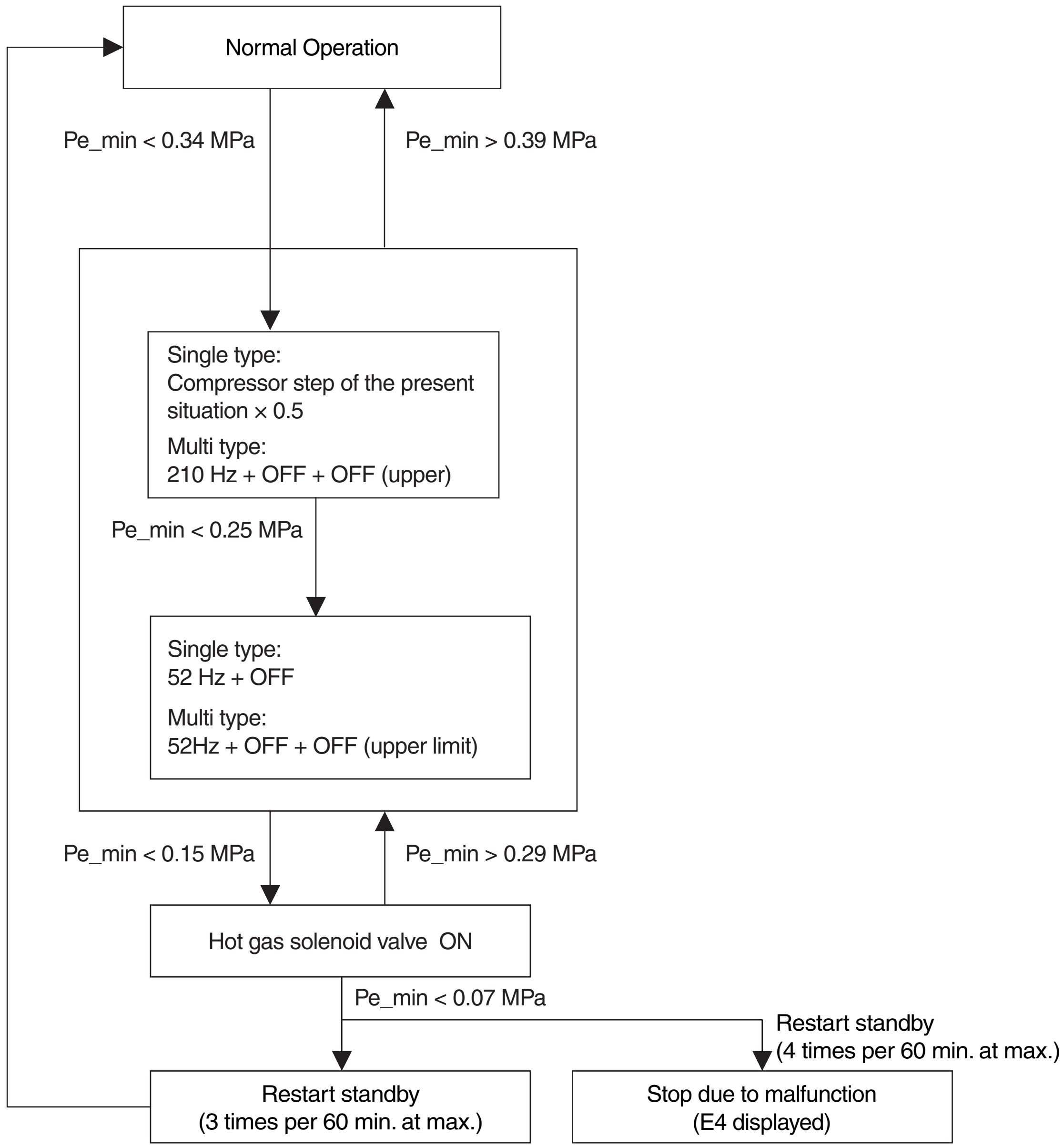


2.6.2 Low Pressure Protection Control

This low pressure protection control is used to protect compressors against the transient decrease of low pressure.

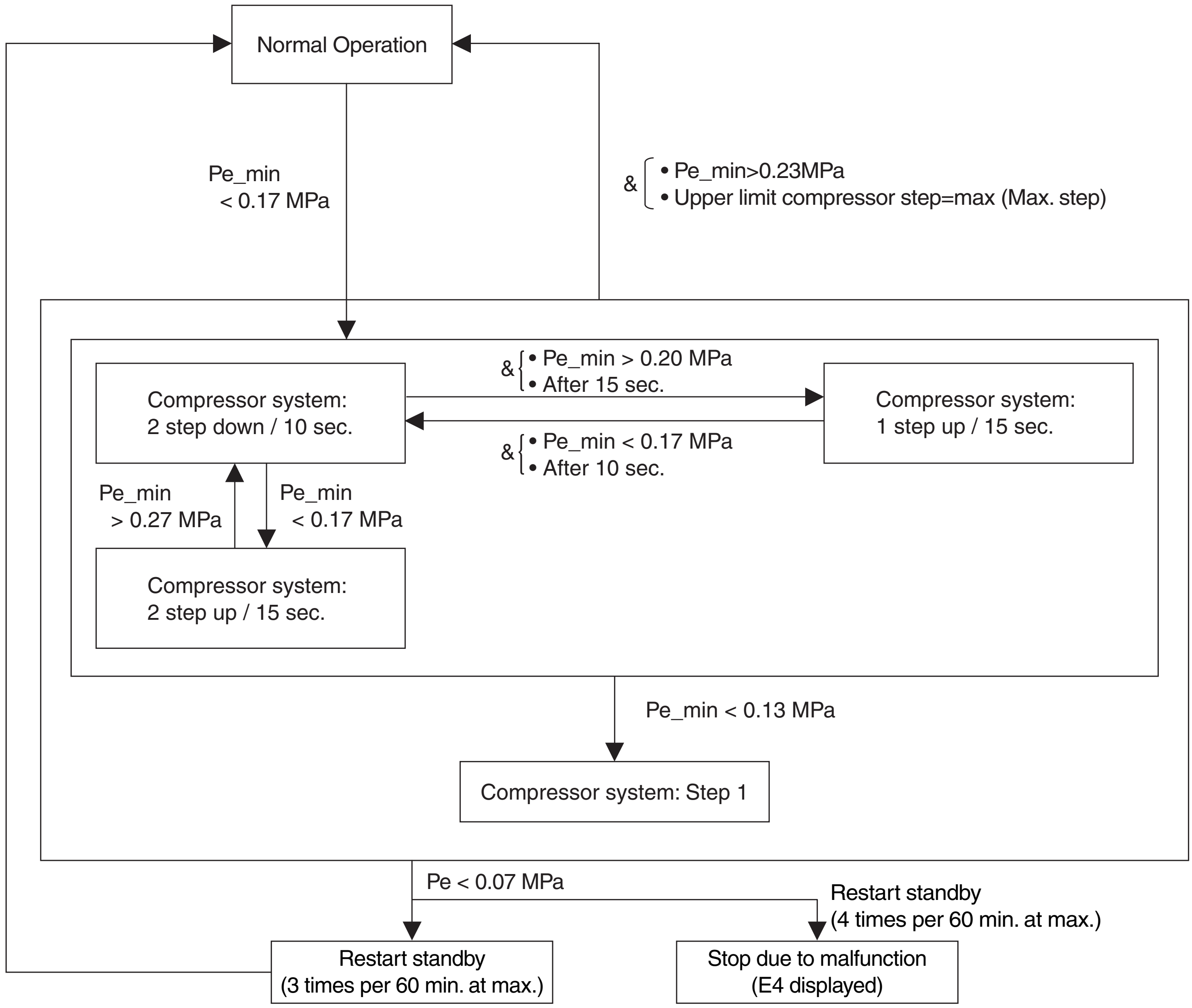
[In cooling operation]

★ Because of common low pressure, the following control is performed in the system.
Pe_min indicates the minimum value within the system.



[In heating operation and Simultaneous Cooling / Heating Operation]

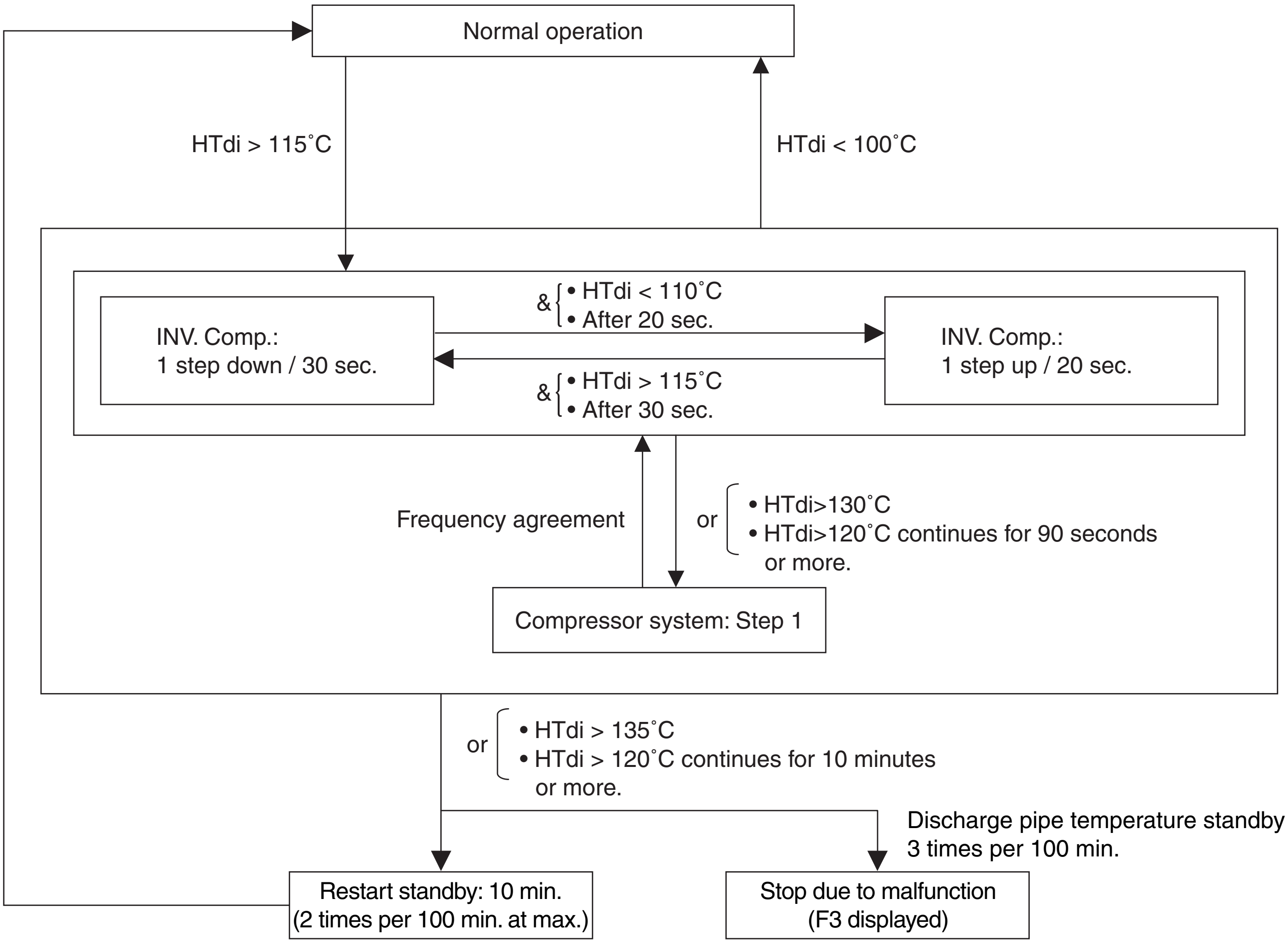
★ The following control is performed in the system.
Pe_min indicates the minimum value within the system.



2.6.3 Discharge Pipe Protection Control

This discharge pipe protection control is used to protect the compressor internal temperature against a malfunction or transient increase of discharge pipe temperature.
The following control is performed for each compressor.

[INV compressor]



HTdi: Value of INV. compressor discharge pipe temperature compensated with outdoor air temperature.

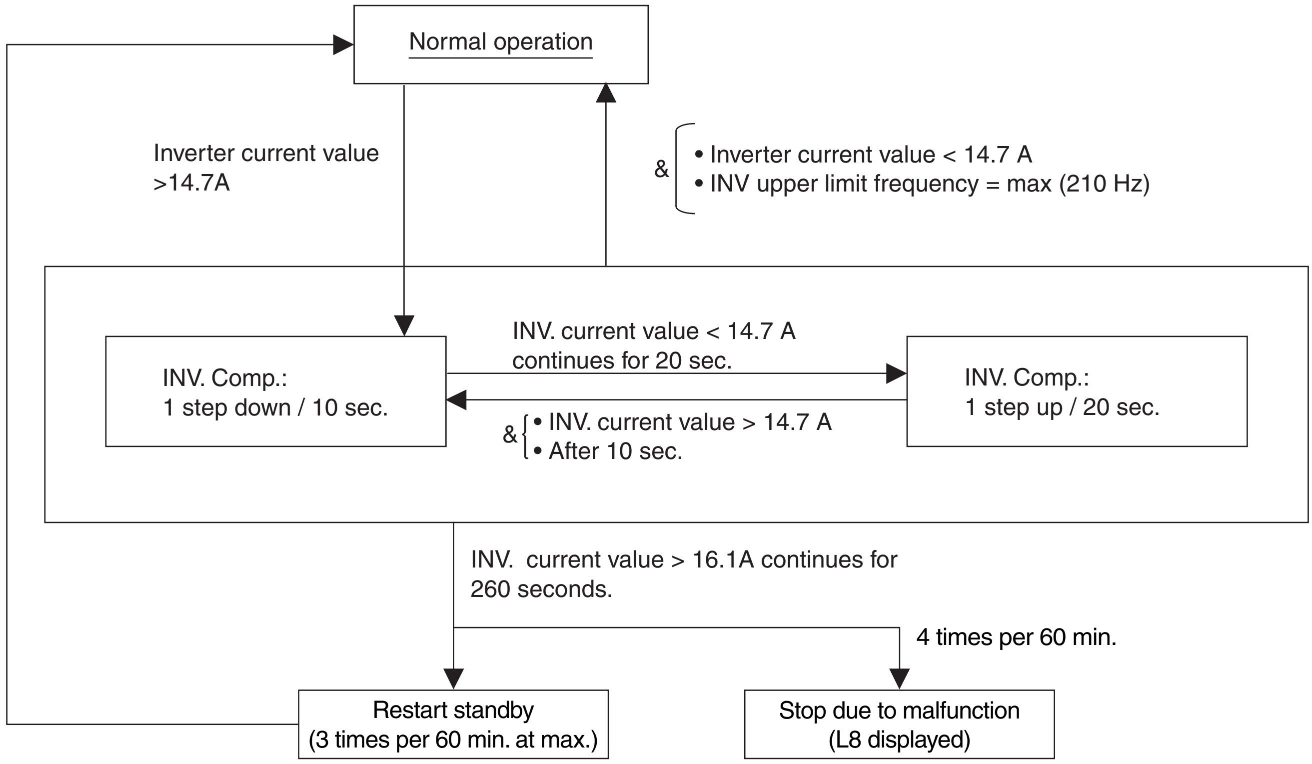
2.6.4 Inverter Protection Control

Inverter current protection control and inverter fin temperature control are performed to prevent tripping due to a malfunction, or transient inverter overcurrent, and fin temperature increase.

★ In the case of multi-outdoor-unit system, each INV compressor performs these controls in the following sequence.

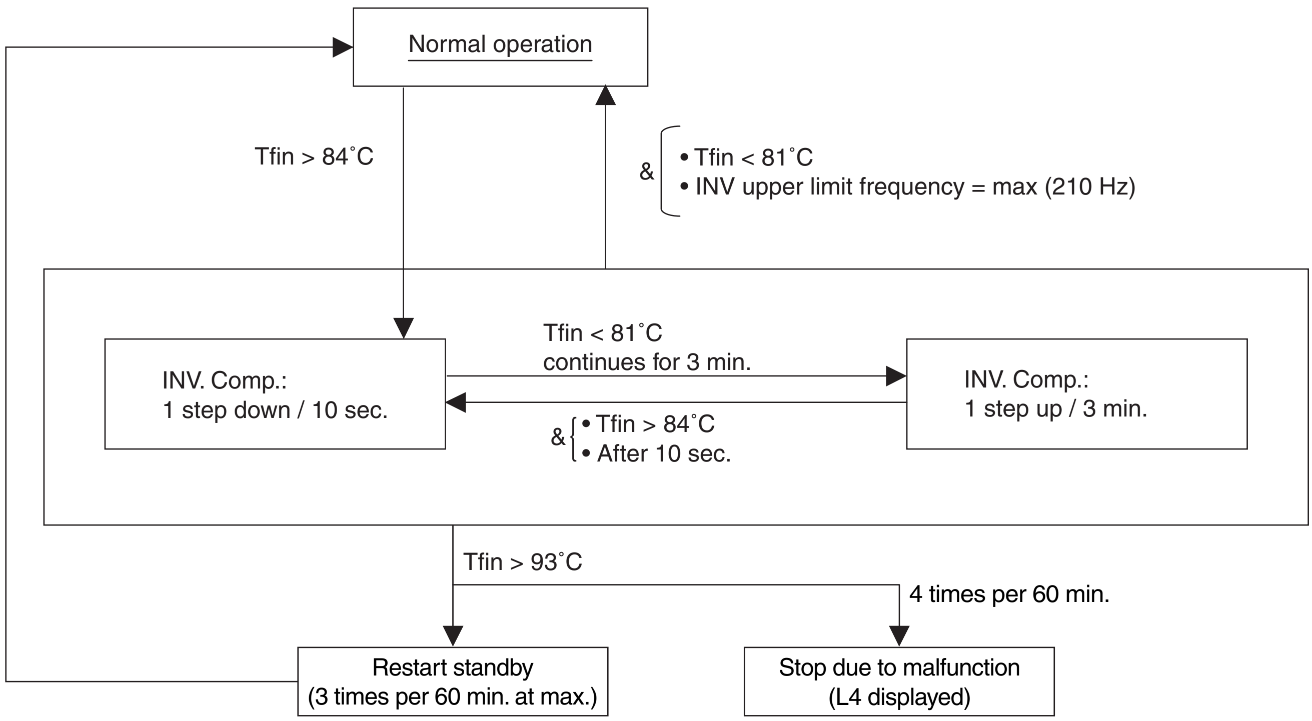
[Inverter overcurrent protection control]

★ Perform the following control of integrated as well as multi units for each INV compressor.



[Inverter fin temperature control]

★ Perform the following control of integrated as well as multi units for each INV compressor.



2.7 Special Control

2.7.1 Pump down Residual Operation

If the liquid refrigerant stays in the evaporator at the startup of a compressor, this liquid refrigerant enters the compressor, thus resulting in diluted oil in the compressor and then degraded lubrication performance.
Consequently, in order to recover the refrigerant in the evaporator while the compressor stops, the pump down residual operation is conducted.

Part Name	Electric Symbol	Normal Cooling		Normal Simultaneous Cooling / Heating	
		Master Unit	Slave Unit	Master Unit	Slave Unit
Compressor	M1C	124 Hz	OFF	124 Hz	OFF
Outdoor unit fan	M1F	Fan control	Fan control	Fan control	Fan control
Electronic expansion valve (Main)	Y1E	480 pls	0 pls	Four way valve "ON": 0 pls Four way valve "OFF": 480 pls	Four way valve "ON": 0 pls Four way valve "OFF": 480 pls
Electronic expansion valve (Refrigerant charge)	Y2E	0 pls	0 pls	0 pls	0 pls
Electronic expansion valve (Subcooling)	Y3E	0 pls	0 pls	0 pls	0 pls
Solenoid valve (Refrigerant regulator hot gas)	Y1S	OFF	OFF	OFF	OFF
Solenoid valve (Refrigerant regulator liquid pipe)	Y2S	OFF	OFF	OFF	OFF
Solenoid valve (Refrigerant regulator gas vent pipe)	Y3S	OFF	OFF	OFF	OFF
Solenoid valve (Hot gas)	Y4S	OFF	OFF	OFF	OFF
Solenoid valve (Circuit of oil return)	Y5S	OFF	OFF	OFF	OFF
Four way valve (Heat exchanger switch)	Y6S	OFF	OFF	OFF	OFF
Four way valve (Dual pressure gas pipe)	Y7S	OFF	OFF	OFF	OFF
Four way valve (Mixing unit)	Y8S	OFF	OFF	OFF	OFF
Solenoid valve (Mixing unit inlet)	Y9S	OFF	OFF	OFF	OFF
Ending condition		OR • 5 min. passed • Pe_min<0.49MPa • Pc_max>2.94MPa • Master unit Tdi > 110°C • Master unit Tp > 125°C		OR • 3 min. passed • Pe_min<0.25MPa • Pc_max>3.13MPa • Master unit Tdi > 110°C • Master unit Tp > 140°C	

2.7.2 Cooling Oil Return Operation

In order to prevent the compressor from running out of oil, the oil return operation is conducted to recover oil flown out from the compressor to the system side.

[Start conditions]

Referring to the set conditions for the following items, start the oil return operation in cooling.

- 2 hours after initial power ON
- A lapse of every 1 ~ 2 hours during low-load operation
- A lapse of every 8 hours during high-load operation

Part Name	Electric Symbol	Oil return operation
Compressor	M1C	System frequency in oil return "IN" X 0.8, then constant control under low pressure (∗ When a unit has been stopped: 52Hz for all units)
Outdoor unit fan	M1F	Fan control in normal cooling
Electronic expansion valve (Main)	Y1E	480 pls
Electronic expansion valve (Refrigerant charge)	Y2E	0 pls
Electronic expansion valve (Subcooling)	Y3E	0 pls
Solenoid valve (Refrigerant regulator hot gas)	Y1S	OFF
Solenoid valve (Refrigerant regulator liquid pipe)	Y2S	OFF
Solenoid valve (Refrigerant regulator gas vent pipe)	Y3S	OFF
Solenoid valve (Hot gas)	Y4S	OFF
Solenoid valve (Circuit of oil return)	Y5S	OFF
Four way valve (Heat exchanger switch)	Y6S	OFF
Four way valve (Dual pressure gas pipe)	Y7S	OFF
Four way valve (Mixing unit)	Y8S	OFF
Solenoid valve (Mixing unit inlet)	Y9S	OFF
Ending condition		OR [• 2 min. passed • TsA-Te < 2°C]

∗ In the case of multi-outdoor-unit system,
Master unit: Performs the operations listed in the table above.
Slave units: Operating units perform the operations listed in the table above.
Non-operating units perform the operations listed in the table above from the oil return operation.
(Non-operating unit stops during “oil return preparation operation”.)

<Indoor Unit>

Part Name	Electric Symbol	Cooling oil return operation		
		Thermostat ON unit	Thermostat OFF unit	Stopping unit
Indoor unit fan	M1F	Remote controller setting	Remote controller setting	OFF
Electronic expansion valve (Main)	Y1E	Normal opening (SHS21)	Normal opening degree for forced thermostat ON	224 pls

<BS Unit>

Part Name	Electric Symbol	Cooling oil return operation
Electronic expansion valve (EVSC)	Y1E	0 pls
Electronic expansion valve (EVHS)	Y2E	0 ~ 60 pls (Pc_max ~ 2.85 MPa)
Electronic expansion valve (EVLS)	Y3E	480 pls (fully opened)
Electronic expansion valve (EVH)	Y4E	0 pls
Electronic expansion valve (EVL)	Y5E	760 pls (fully opened)

2.7.3 Heating Oil Return Operation and Defrost Operation

• RQYQ140 · 180PY1, RQCYQ280 ~ 560PY1

[Heating Oil Return Operation]

Referring to the set conditions for the following items, start the oil return operation in heating.

- 2 hours after initial power ON
- A lapse of every 1 ~ 2 hours during low-load operation
- A lapse of every 8 hours during high-load operation

[Defrosting Operation]

To defrost the outdoor unit heat exchanger while in heating operation, the defrost operation is conducted to recover the heating capacity.

[Start conditions]

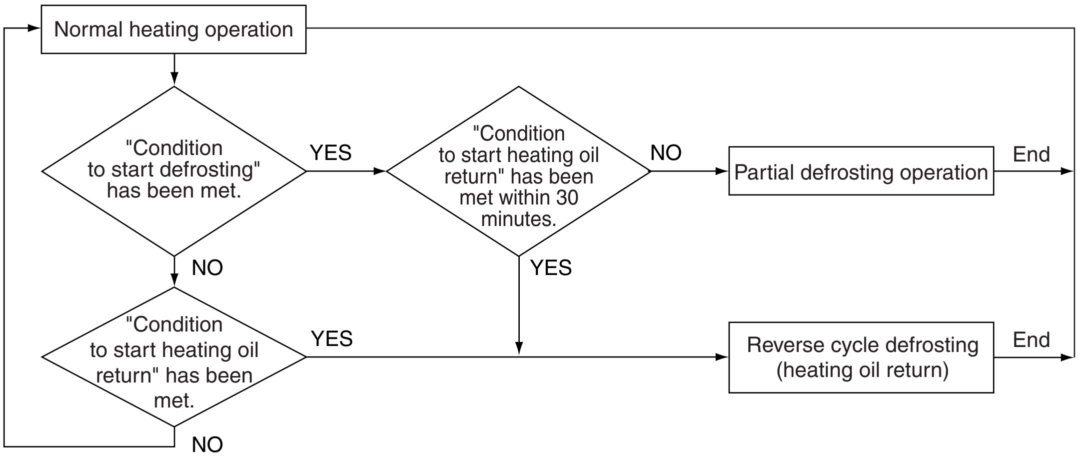
Referring to the set conditions for the following items, start the defrosting operation.

- A lapse of every 1 hour during high-load operation
- A lapse of every 2 hours during low-load operation

Part Name	Electric Symbol	Heating oil return and defrost operation
Compressor	M1C	188 Hz
Outdoor unit fan	M1F	OFF
Electronic expansion valve (Main)	Y1E	480 pls
Electronic expansion valve (Refrigerant charge)	Y2E	SH control
Electronic expansion valve (Subcooling)	Y3E	By "Adjusting control of the refrigerant amount"
Solenoid valve (Refrigerant regulator hot gas)	Y1S	By "Adjusting control of the refrigerant amount"
Solenoid valve (Refrigerant regulator liquid pipe)	Y2S	By "Adjusting control of the refrigerant amount"
Solenoid valve (Refrigerant regulator gas vent pipe)	Y3S	By "Adjusting control of the refrigerant amount"
Solenoid valve (Hot gas)	Y4S	ON
Solenoid valve (Circuit of oil return)	Y5S	OFF
Four way valve (Heat exchanger switch)	Y6S	OFF
Four way valve (Dual pressure gas pipe)	Y7S	ON
Four way valve (Mixing unit)	Y8S	OFF
Solenoid valve (Mixing unit inlet)	Y9S	OFF
Indoor unit fan	M1F	OFF
Electronic expansion valve (Main)	Y1E	1216 pls → Suction SH control
Ending condition		& [• OR [• Pc > 2.94 MPa • Tb > 11˚C • 12 min. passed] • OR [• 6 min. passed • & [• TsA-Te > 5˚C • 30 sec. passed]]]

• RQCEQ280 ~ 848PY1

"Reverse cycle defrosting (heating oil return)" and "Partial defrosting" are available depending on the combination of the starting condition for units of this series.



[Defrost operation start conditions]

- A lapse of every 2 hours during low-load operation
- A lapse of every 1 hours during high-load operation

[Heating oil return operation start conditions]

- 2 hours after initial power ON
- A lapse of every 1 ~ 2 hours during low-load operation
- A lapse of every 8 hours during high-load operation

Part Name	Electric Symbol	Partial defrosting operation	Reverse cycle defrosting (heating oil return)
Compressor	M1C	124Hz → 232 Hz	188 Hz
Outdoor unit fan	M1F	Defrost unit: OFF Heating unit: Fan control	OFF
Electronic expansion valve (Main)	Y1E	Defrost unit: 480 pls Heating unit: 4 pls → Low pressure control	480 pls
Electronic expansion valve (Refrigerant charge)	Y2E	SH control	SH control
Electronic expansion valve (Subcooling)	Y3E	By "Adjusting control of the refrigerant amount"	By "Adjusting control of the refrigerant amount"
Solenoid valve (Refrigerant regulator hot gas)	Y1S	By "Adjusting control of the refrigerant amount"	By "Adjusting control of the refrigerant amount"
Solenoid valve (Refrigerant regulator liquid pipe)	Y2S	By "Adjusting control of the refrigerant amount"	By "Adjusting control of the refrigerant amount"
Solenoid valve (Refrigerant regulator gas vent pipe)	Y3S	By "Adjusting control of the refrigerant amount"	By "Adjusting control of the refrigerant amount"
Solenoid valve (Hot gas)	Y4S	ON	ON
Solenoid valve (Circuit of oil return)	Y5S	OFF	OFF
Four way valve (Heat exchanger switch)	Y6S	Defrost unit: OFF Heating unit: ON	OFF
Four way valve (Dual pressure gas pipe)	Y7S	Defrost unit: ON Heating unit: OFF	ON
Four way valve (Mixing unit)	Y8S	OFF	OFF
Solenoid valve (Mixing unit inlet)	Y9S	OFF	OFF
Indoor unit fan	M1F	Thermostat ON unit: OFF Others: No instruction	OFF
Electronic expansion valve (Main)	Y1E	0 pls	1216 pls → Suction SH control
Ending condition		& [• OR [• Pc > 2.94 MPa • Tb > 11°C • 12 min. passed] • OR [• 6 min. passed • & [• TsA-Te > 5°C • 30 sec. passed]]]	& [• OR [• Pc > 2.94 MPa • Tb > 11°C • 12 min. passed] • OR [• 6 min. passed • & [• TsA-Te > 5°C • 30 sec. passed]]]

2.7.4 Outdoor Unit Rotation

In the case of multi-outdoor-unit system, this outdoor unit rotation is used to prevent the compressor from burning out due to unbalanced oil level between outdoor units.

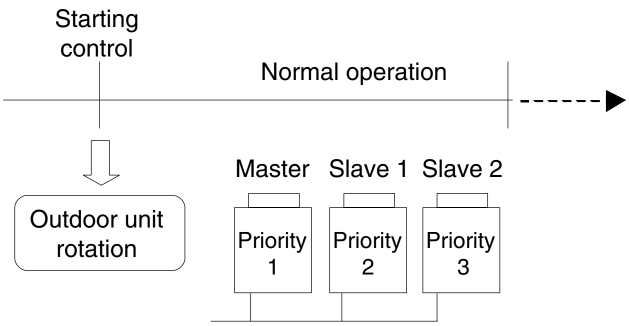
[Details of outdoor unit rotation]

In the case of multi-outdoor-unit system, each outdoor unit is given an operating priority for the control.
Outdoor unit rotation makes it possible to change the operating priority of outdoor units.
Thus, the system becomes free of compressors that stop over an extended period of time at the time of partial loading, preventing unbalanced oil level.

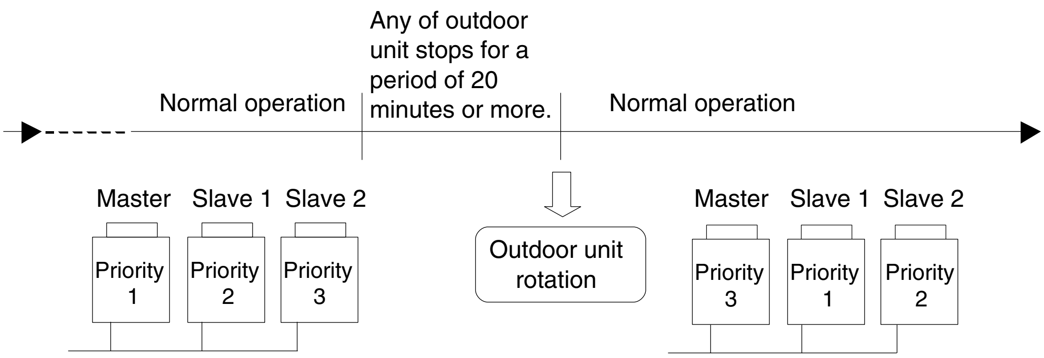
[Timing of outdoor unit rotation]

or
- At the beginning of the starting control
- When any of outdoor unit stops for a period of 20 minutes or more (in heating)

Example) The following diagram shows outdoor unit rotation in combination of 3 outdoor units. (in heating)



<In Heating>



* "Master unit", "slave unit 1" and "slave unit 2" in this section are the names for installation.
They are determined in installation work, and not changed thereafter. (These names are different from "master unit" and "slave unit" for control.)
The outdoor unit connected the control wires (F1 and F2) for the indoor unit should be designated as main unit.
Consequently, The LED display on the main PCB for "master unit", "slave unit 1" and "slave unit 2" do not change.

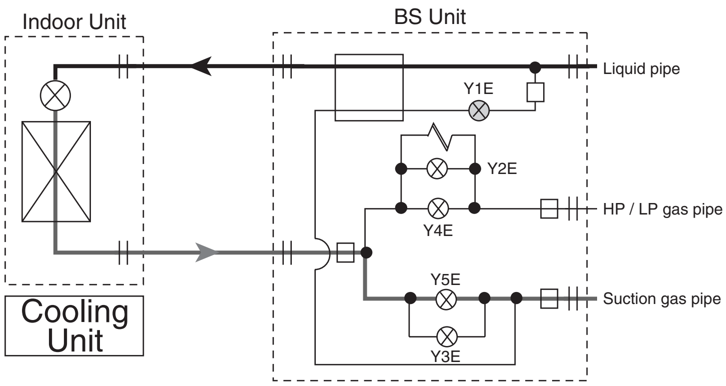
2.7.5 Cooling/heating mode changeover

[Single room cooling under mixed cooling and heating conditions → heating]

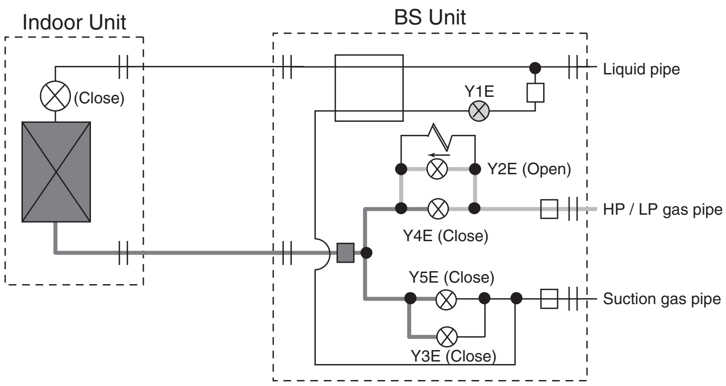
First, close all of the indoor unit electronic expansion valve and BS unit electronic expansion valves Y2E, Y3E, Y4E and Y5E under the cooling operation condition.

Next, open the electronic expansion valve Y2E and perform an equalizing operation. Subsequently, both the electronic expansion valve Y4E and the indoor unit electronic expansion valve open to become a heating circuit. The changeover time is about 6 minutes. (However, this can be shortened from 6 minutes to 4 minutes depending on the onsite setting.)

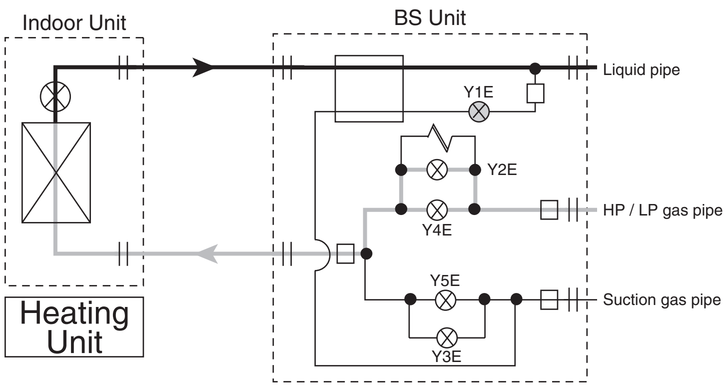
(1) Cooling operation



(2) Pressure equalizing

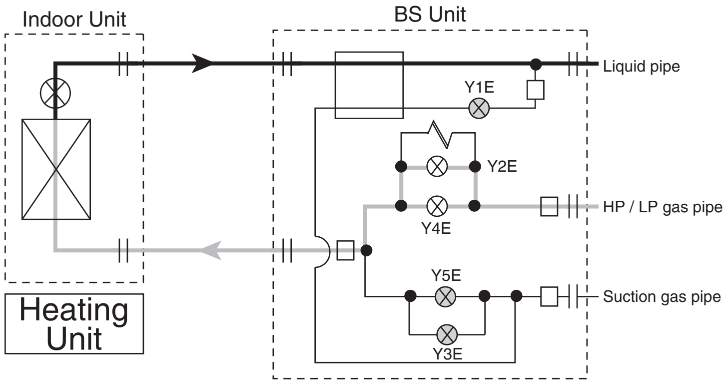


(3) Heating operation

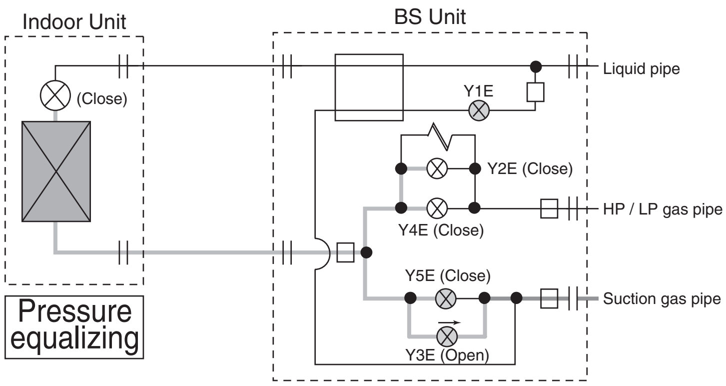


[Single room heating under mixed cooling and heating conditions → cooling]
First, close all of the indoor unit electronic expansion and BS unit electronic expansion valves Y2E, Y3E, Y4E and Y5E under the heating operation condition.
Next, open the electronic expansion valve Y3E and perform an equalizing operation. Subsequently, the electronic expansion valve Y5E opens and the indoor unit electronic expansion valve adjusts the opening extent to become a cooling circuit. The changeover time is about 6 minutes. (However, this can be shortened from 6 minutes to 4 minutes depending on the onsite setting.)

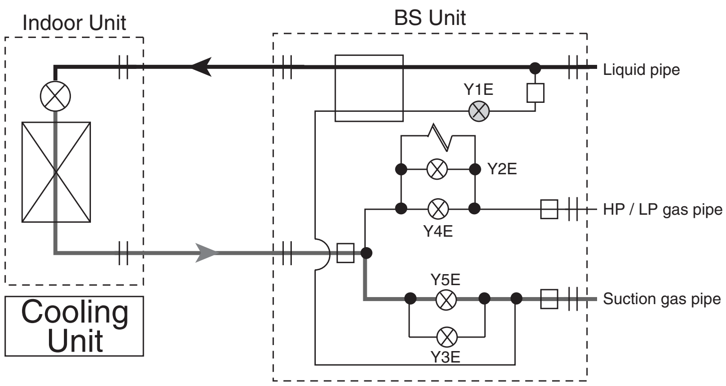
(1) Heating operation



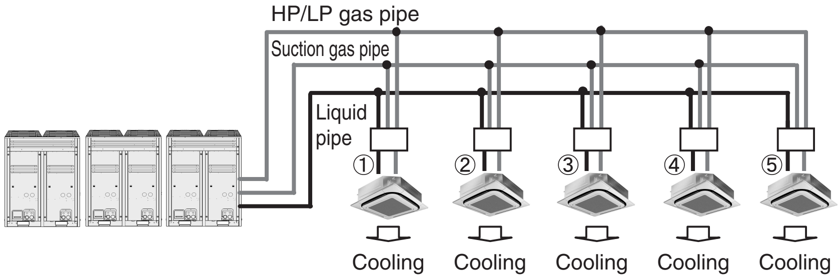
(2) Pressure equalizing



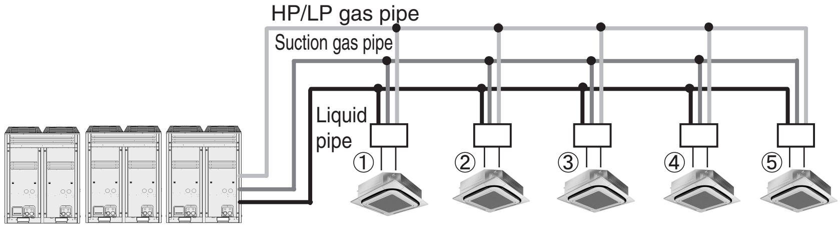
(3) Cooling operation



[All-room cooling → all-room heating or simultaneous cooling and heating]

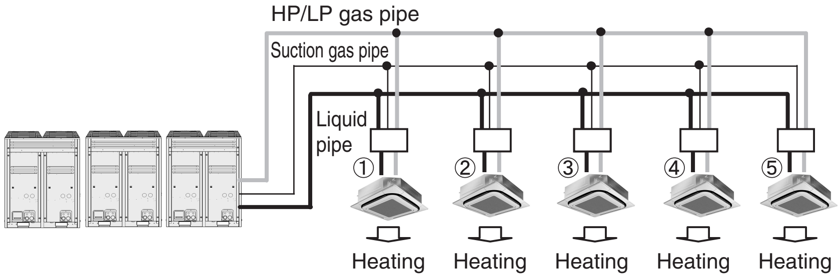


(1) While all indoor units are in cooling operation
- HP/LP gas pipe is used as a suction gas pipe.



(2) Mode changeover
- Switch HP/LP gas pipe from low to high pressure

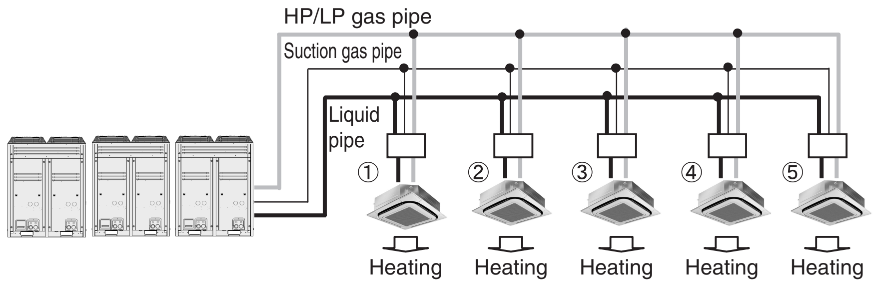
All indoor units
- Fan stop
- Changeover time is 3.5 minutes (changeover time for control). (During the changeover: stop the compressor for 30 seconds.)



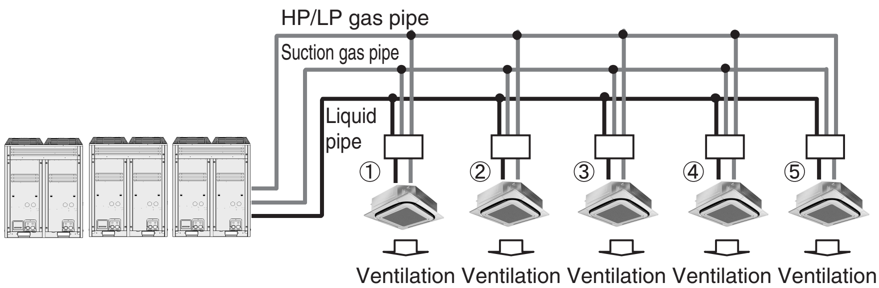
(3) Heating or simultaneous cooling and heating

Each indoor unit
- Starts the hot air supply operation by cold air prevention control (3-5 minutes)

[All-room heating or simultaneous cooling and heating → all-room cooling]

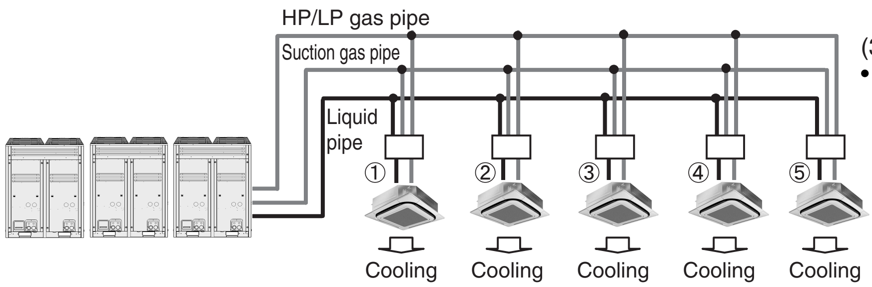


(1) While the unit is in heating operation or simultaneous cooling and heating operation
- HP/LP gas pipe is used as a discharge gas pipe.



(2) Mode changeover
- Switch HP/LP gas pipe from high to low pressure

All indoor units
- Ventilation
- Changeover time is 3.5 minutes (changeover time for control). (During the changeover: Stop the compressor for 30 seconds.)



(3) Change all units to cooling operation.
- Cool air supply operation

2.7.6 Emergency Operation

Stop the compressor or the outdoor unit and bring only the operable compressor and outdoor unit into emergency operation. "Emergency operation by a remote controller" and "Emergency operation by outdoor unit PCB" are available for the operation.

Setting method / Model	(1) Emergency operation by remote controller (Automatic backup operation)	(2) Emergency operation by outdoor unit PCB (Manual backup operation)
RQCYQ ~ PY1, RQCEQ ~ PY1	Backup operation per outdoor unit	Backup operation per outdoor unit

• Emergency operation by remote controller

[Operating method]

By setting a remote controller (Press and hold the ON/OFF button for at least 4 seconds.)

[Details of Operation]

Stop the faulty outdoor unit and operate only other outdoor units (This emergency operation is not available for one outdoor unit system).

• Emergency operation by outdoor unit PCB

[Setting method]

Set the compressor to be stopped by the onsite setting (setting mode 2).
(Refer to P. 90 for details of the setting.)

[Details of Operation]

Stop operating the "Disabled" compressor and outdoor units and operate another compressor and outdoor units. (The emergency operation is not available for a single unit system.)

Part 5
Test Operation

1. Test Operation

1.1 Procedure and Outline

Follow the following procedure to conduct the initial test operation after installation.

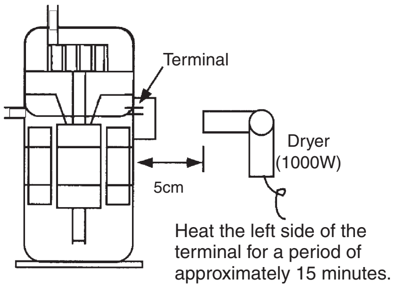
1.1.1 Check work prior to turn power supply on

Check that the installation work for the indoor and outdoor units has been performed in accordance with the instructions in the Installation Manual.

Check the below items.
- Power wiring
- Control transmission wiring between units
- Earth wire
- Branch switch
- Earth leakage circuit breaker

○ Is the wiring performed as specified?
○ Are the branch switches and earth leakage circuit breakers wired correctly?
○ Is the designated wire used?
○ Is the wiring screw of wiring not loose?
○ Is the grounding work completed?
○ Is the insulation of the main power supply circuit deteriorated?
Use a 500V megger tester to measure the insulation. (*1)
• Do not use a megger tester for other circuits than 400V or 200V circuit.

*1:Measure to be taken against decreased insulation resistance in the compressor
If the compressor is left to stand for an extended period of time after the refrigerant charge with the stop valve open and the power supply OFF, the refrigerant may be mixed in the compressor, thus decreasing the insulation resistance.
Heat the compressor as shown on the right and then recheck the insulation.



⇩

Check on refrigerant piping / insulation materials

○ Is the pipe size proper? Are the design pressures for the gas pipe and liquid pipe more than 3.3MPa?
○ Is the pipe insulation material installed securely?
Liquid and gas pipes need to be insulated. (Otherwise causes water leak.)

⇩

Check air tight test and vacuum drying.

○ Have the air tight test and the vacuum drying been conducted according to the procedure in the Installation Manual?

⇩

Check on amount of additional refrigerant charge

○ Is a proper quantity of refrigerant charged?
* Refer to the following page for the calculation of the amount of additionally refrigerant charge.
• When the refrigerant level is insufficient, leave the liquid and gas stop valves closed and charge with liquid refrigerant via the liquid stop valve service port. (* Do not charge via the gas stop valve service port. Doing so will result in malfunction.)
○ Is the amount of additional refrigerant charge recorded in the [Service Precaution] label?

⇩

Check the stop valves for conditions.

○ Check to be sure the stop valves are under the following conditions.

Model	Liquid-side stop valve	Gas-side stop valve
RQYQ140 · 180PY1	Open	Open

Model	Liquid-side stop valve	Gas-side stop valve	Dual pressure gas-side stop valve
RQEQ140 ~ 212PY1	Open	Open	Open

* **How to calculate additional refrigerant charging amount (Unit: 0.1 kg)**

$$R = \left[\begin{pmatrix}\text{Total length of}\\ \phi 22.2\text{-mm}\\ \text{liquid pipe)}\end{pmatrix} \times 0.37 + \begin{pmatrix}\text{Total length of}\\ \phi 19.1\text{-mm}\\ \text{liquid pipe)}\end{pmatrix} \times 0.26 + \begin{pmatrix}\text{Total length of}\\ \phi 15.9\text{-mm}\\ \text{liquid pipe)}\end{pmatrix} \times 0.18 + \begin{pmatrix}\text{Total length of}\\ \phi 12.7\text{-mm}\\ \text{liquid pipe)}\end{pmatrix} \times 0.12 + \begin{pmatrix}\text{Total length of}\\ \phi 9.5\text{-mm}\\ \text{liquid pipe)}\end{pmatrix} \times 0.059 + \begin{pmatrix}\text{Total length of}\\ \phi 6.4\text{-mm}\\ \text{liquid pipe)}\end{pmatrix} \times 0.022 \right] \times A$$

+ B (Correction with outdoor unit capacity) + C (Correction with indoor unit capacity)

Model		A	B kg	C kg	
				≤100%	>100%
RQYQ	140 · 180PY1	1.00	-2.4kg	0.0kg	0.5kg
RQCYQ	280PY1	1.02	-6.8kg	0.0kg	0.5kg
	360PY1		-6.8kg		
	460PY1		-11.2kg		
	500PY1		-11.2kg		
	540PY1		-11.2kg		
RQCEQ	280Py1	1.02	-5.2kg	0.0kg	0.5kg
	360PY1		-5.8kg		
	460PY1		-9.1kg		
	500PY1		-9.4kg		
	540PY1		-9.7kg		
	636PY1		-11.2kg		
	712PY1		-13.8kg		
	744PY1		-14.3kg		
	816PY1		-15.1kg		
	848PY1		-15.6kg		

1.1.2 Turn power on

Turn outdoor unit and indoor unit power on.

○ Be sure to turn the power on 6 hours before starting operation to protect compressors.

⇩

Check the LED display of the outdoor unit PCB.

○ Check to be sure the transmission is normal.
The transmission is normal if the LEDs display conditions as shown in table below.

LED display ○ ON ● OFF ◑ Blinking

LED display (Default status before delivery)		Micro-computer operation monitor	MODE	TEST	COOL / HEAT select			Low noise	Demand	Multi
					IND	MASTER	SLAVE			
		HAP	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
One outdoor unit installed		◑	●	●	○	●	●	●	●	●
When multiple outdoor unit installed (*)	Master	◑	●	●	○	●	●	●	●	○
	Slave 1	◑	●	●	●	●	●	●	●	◑
	Slave 2	◑	●	●	●	●	●	●	●	◑
	Slave 3	◑	●	●	●	●	●	●	●	◑

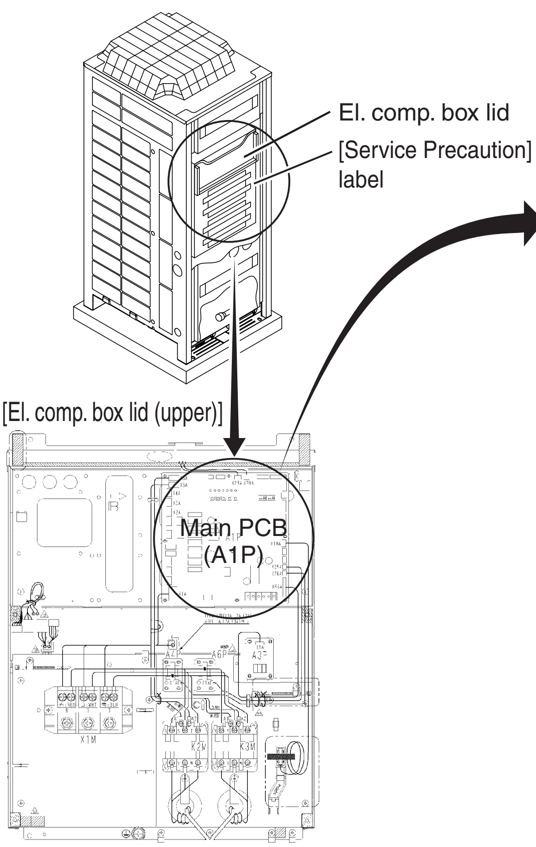
(*) The master unit is the outdoor unit to which the transmission wiring for the indoor units is connected.
The other outdoor units are slave units.

⇩

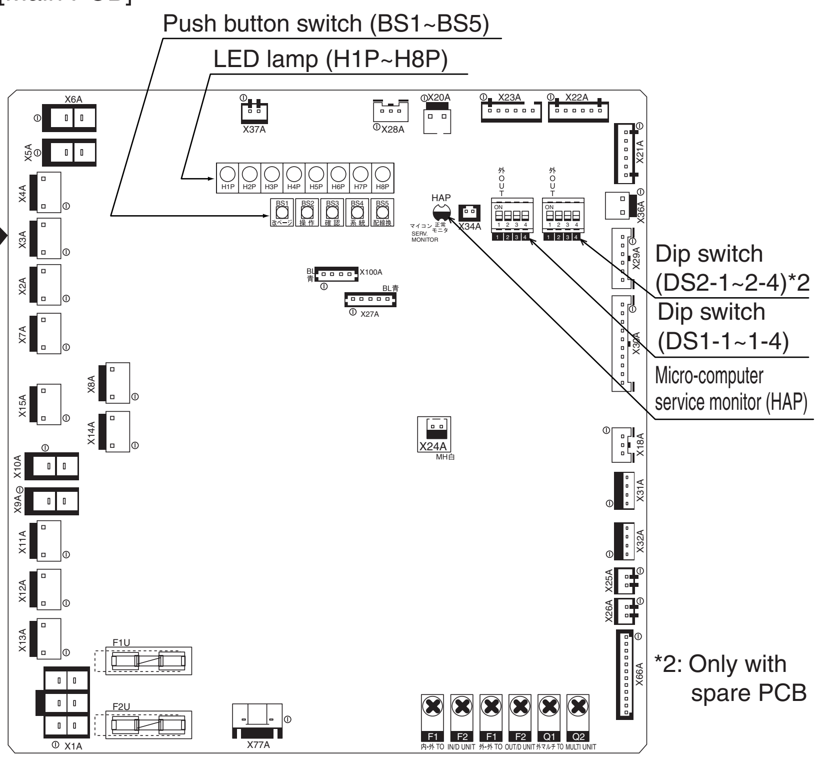
Make field settings with outdoor unit PCB.

○ Make field settings if needed.
(For the setting procedure, refer to information in "Field Setting from Outdoor Unit" on page 69 onward.)
For the outdoor-multi system, make field settings with the master unit.
(Field settings made with the slave unit will be all invalid.)

[Outdoor unit]



[Main PCB]



1.2 Check Operation

1.2.1 RQYQ / RQEQ-PY1

Procedures	Operational Conditions (Each of mentioned below is a standard operation time. This may vary based on the installation circumstances, etc.)
(1)Turn to [Set-up Mode 1] (H1P : OFF). H1P light is usually out. If H1P is (BLINK) or (ON), press "MODE" button (BS1) once to go into [Set-up Mode 1]. (If H2P is lighted-on, check the defect codes with a remote controller to find out the cause. Repair the defect part according to the list on the installation manual.)	Normal (H2P : OFF) Defect (H2P : ON)
(2) After confirmed that it's back in a normal condition, press "TEST" button (BS4) for longer than 5 seconds. It starts warming-up for the operation, and LED indication turns as right descriptions. Close all the outside panels after putting back the service cover. (*2)	Startup and waiting operation for stable conditions (approx.10 to 25 min.) The outdoor and indoor unit fan is operated in order to stabilize the refrigerant conditions. And then the compressor starts operation.
↓	Operation to check stop valve and mis-wiring (approx. 5 min.) (Contamination prevention is operated at the same time.)
↓ (When re-charging is not required: go directly to (4))	Operation to check refrigerant amount (approx. 10 to 20 min.) Check the refrigerant amount, and make adjustments. (Contamination prevention is operated at the same time.)
(3) When re-charging is required (*4) 1. • When the system stop operation, open the outside panel of the EL.compo. box, then check the LED indications through the inspection door. If the LED indicate as right, connect the refrigerant tank to the refrigerant re-charging port. • Press the test operation button (BS4) for longer than 5 seconds after connection of the refrigerant tank. LED change indications, then re-start. (Use a refrigerant cylinder with sufficient amount of refrigerant.)	The system stop operation for warming-ups before re-charging of refrigerant, then LED indicate to connect the refrigerant tank (as on the right).
↓	Stand-by for a stable condition after the restart. (approx. 1 to 3 min.)
2. • Open the valve of the refrigerant tank after LED indications turns as right. (*3) • Press the "TEST" button (BS4) once within 3 min. after opening the valve. LED change indications. • Immediately close the inspection door and all the outside panels. (*2)	LED indicate to open the valve of the refrigerant tank (as on the right), and wait to press the "TEST" button (BS4).
↓	Operation for re-charging of refrigerant (1~60 min.) (Contamination prevention is operated at the same time.)
If the malfunction code PA is displayed on the remote controller, open the outside panel of the EL. compo.box, check the LED indications through the inspection door.	The system stop operation due to insufficient re-charging of refrigerant, then LED indicate to replace the refrigerant tank (as on the right).
↓	Automatic measuring of piping length (approx.1 min.) This is to check the length of field pipings.
(4) • After the system stop operation, open the outside panel of the EL.compo. box, then check the LED indications through the inspection door. • When completed properly. • Disconnect the refrigerant tank. • Close all the outside panels after putting back the inspection door. • When abnormal stop • Malfunction code is displayed on the remote controller, check the malfunction code No.	Properly completed (H2P : OFF) Abnormal stop due to the low pressure drops (H2P: Blinking) Defect determined (H2P : ON)

LED indications :OFF :ON :BLINK

MODE	HWL:	C/H SELECTOR			L.N.O.P	DEMAND	indications on remote controller (*1)
		IND	MASTER	SLAVE			
H1P	H2P	H3P	H4P	H5P	H6P	H7P	
●	●	○	●	●	●	●	A
●	○	○	●	●	●	●	B
●	◑	●	●	●	●	○	C
●	◑	●	●	●	○	○	C
LED indications to connect the refrigerant tank							
◑	◑	◑	●	○	●	●	D (P8)
●	◑	●	●	○	●	●	C
LED indications to [open] the valve of refrigerant							
◑	◑	◑	●	○	●	○	C (*3)
●	◑	●	●	○	●	○	C
LED indications as re-charging amount of refrigerant is not sufficient.							
◑	◑	◑	●	◑	●	●	D (PA)
●	◑	●	●	○	○	●	C
●	●	○	●	●	●	●	A
●	◑	◑	●	●	●	○	B (P2)
●	○	○	●	●	●	●	B

■ **Functions of push-button**

BS1	BS2	BS3	BS4	BS5
MODE	SET	RETURN	TEST	RESET

- BS5 (RESET): Press to reset the address when changing the wiring, or indoor units are added.
- BS4 (TEST): Use for a check operation.
- BS3 (RETURN):
  - Press to confirm the settings,
  - To cancel test operation,
  - To go back to procedure (1) after repair of defect part. (cancellation of error code)
- BS2 (SET): Press to select setting items.
- BS1 (MODE):
  - Press to change setting modes,
  - Press to go back to procedure (1), when missing the procedures.

(C → C)
- If the system stops and a indoor remote controller indicates any defect, repair the defect part according to [Remote controller displays malfunction code.] Test operate again after the repair.
- To test operate again, press the "RETURN" button (BS3) to turn the LED back to "normal" indications as procedure (1).

(C (*3)) If the "TEST" button (BS4) is not pressed within 3 min. after the indication to open the valve, it goes back to procedure (3) 1 and stops the system again. (→ D (P8))

(D (PA)) In this case, either refrigerant tank became empty, or the valve of the refrigerant tank is not open. (→ C)
- If the refrigerant tank is empty, replace the tank, then press the "TEST" button (BS4) for longer than 5 sec. to re-start the system.
- If the valve of the refrigerant tank is not open, press the "TEST" button (BS4) for longer than 5 sec. to re-start the system.

Then open the valve of the refrigerant tank by following the procedure (3) 2.

(B (P2), B)
- If the system stops and a indoor remote controller indicates any defect, repair the defect part according to [Remote controller displays malfunction code.] Test operate again after the repair.
- To check operate again, press the "RETURN" button (BS3) to turn the LED back to "normal" indications as procedure (1).

(*1) : Please refer to [Remote controller indications at check operation] to confirm the details of each indication.
(*2) : If outside panels are not closed, it may not be able to operate normally when outdoor temperature is high, etc.
(*3) : Remote controller does not indicate the procedures. Make sure to check the LED indications upon operation.
(*4) : Record the amount of refrigerant re-charge on the [Safety precaution] label.

⚠ WARNING ⚠ ELECTRIC SHOCK WARNING

- Do not move away from the outdoor unit if outside panel is not closed during a test operation.
- In case you need to move away from the outdoor unit, follow either one of the below directions
  1. Replace with other installation worker.
  2. Push the "RETURN" button (BS3) to cancel the test operation. (In this case, close all the outside panel, and close also the valve if any cylinder is connected.)

[Remote controller displays malfunction code]

Malfunction code	Installation error	Remedial action
A* C* (Note)	Indoor unit of connecting remote controller is malfunction.	Correct the malfunction by reference to installation manual of indoor unit or operation manual of outdoor unit.
E3, F4 F3, UF	The stop valve of the outdoor unit is left closed.	Open the stop valve.
U1	The phases of the power to the outdoor unit are reversed.	Exchange two of the three phases (L1, L2, L3) and connect with the correct phase.
U3	Check operation has been completed normally.	Perform the check operation again.
U1 U4 LC	Power is not being supplied (including cases of open phase) to the outdoor or BS or indoor unit.	Supply power correctly to the outdoor, BS or indoor unit.
U7 UA	A model which cannot be connected in a multi-outdoor-unit system has been connected in a multi-outdoor-unit system.	Change to individual piping, and disconnect the wiring from the multi-outdoor-unit terminals (Q1, Q2)
U9	There is a problem with another BS and indoor unit within the same system.	A malfunction code is displayed on the remote controller, or else trouble has occurred at BS and indoor unit where a malfunction code is not displayed on the remote controller. Correct the trouble at the corresponding BS and indoor unit. If no malfunction code is displayed on the remote controller, press the Inspection/Test button on the remote controller to display the malfunction code.
UF	Wrong wiring between units.	Agree refrigerant system and connection wire between the units.
UF	If an outdoor - outdoor transmission wire was connected or disconnected during check operation.	Complete the transmission wiring work, then perform check operation again.
U4, U7 UH, UF	Wrong wiring between units.	Connect the interunit wiring (indoor - outdoor, outdoor - outdoor, multi-outdoor-unit). If voltage of 100V or higher was applied to the outdoor unit PCB (A1P), the outdoor unit PCB or BS unit PCB may be damaged. If the malfunction display "UH" appears even after the connection was corrected, the PCB must be replaced. Refer to Service Manual for details.
PJ	DIP switch (DS1) setting is incorrect after the outdoor unit PCB (A1P) was replaced.	Follow the information on spare parts with a spare PCB of outdoor unit and make the correct setting.
P2	Check operation cannot be continued by the low pressure drops.	Check the following. • All stop valves are open. • Refrigerant tank is connected. • Valve of refrigerant tank is open. • Inlet or outlet of indoor unit are not closed due to a foreign object.
P8 PA	Instruction to perform additional refrigerant charging during check operation (not a malfunction).	Make the check operation by "**1.2 Check Operation**".

If any malfunction codes other than the above are displayed, check the service manual for how to respond.

1.3 Checking in Normal Operation

- **After check operation ends, start normal operation.**
  (Heating is not possible if the outdoor temperature is 24°C or higher.)
- Check that the indoor and outdoor units are operating correctly.
  (If any abnormal noise occurs due to liquid compression in the compressor or another cause, stop operation immediately. Then energize the crankcase heater for a sufficient period of time before restarting operation.)
- Start the indoor units one by one. Verify that the corresponding outdoor unit is operating.
- Verify that cool air (or warm air) is being discharged by the indoor unit.
- Press the airflow direction button and airflow rate button of the indoor unit and verify their operation.

<Important information when checking normal operation>

- If any abnormal noise occurs due to liquid compression in the compressor or another cause, stop operation immediately. Then energize the crankcase heater for a sufficient period of time before restarting operation.
- For approximately 5 minutes after the compressor is stopped, the compressor will not start even when the START/STOP buttons at indoor units in that system are pressed.
- Pump-down residual operation may occur for up to 5 minutes at the outdoor unit after operation was stopped from the remote controller.
- Outdoor unit fan low speed operation may also occur if the Night-time low noise setting or the External low-noise setting is used.
- If check operation after installation was not performed by pressing the TEST button, or if the check operation was not completed normally, error code "U3" appears and normal operation is not possible. Be sure to follow the instructions in "1-2. Check Operation" and complete the check operation procedure.

2. Field Setting from Outdoor Unit

2.1 Field Setting from Outdoor Unit

2.1.1 List of Field Setting Items

This following section indicates the list of field setting items. For the lists of dip switch contents, Setting mode 1, and Setting mode 2, refer to information in tables shown on the following page onward.

For setting items of (*1), refer to detailed information provided on page 80 onward.

(1) Function setting items

Setting item		Content and objective of setting	Overview of setting procedure
1	Setting of COOL/ HEAT selection (*1)	■ COOL/HEAT selection methods are possible to select from the following (1) Control by each outdoor unit using the indoor unit remote controller (2) Control by each outdoor unit using the COOL/HEAT selection remote controller (3) Batch control by outdoor unit group using the indoor unit remote controller (4) Batch control by outdoor unit group using the COOL/HEAT selector remote controller	■ In order to use the COOL/HEAT selection remote controller, set the DS1-1 on the outdoor unit PCB to OUT. ■ For outdoor unit group control, set the system to "BATCH MASTER" or "SLAVE" while in "Setting mode 1". Then, make setting of COOL/ HEAT batch address.
2	Setting of low noise operation (*1)	A. Use external input to step down the upper limit of the fan (factory set to Step 8), providing low noise level. (1) Mode 1: Step 6 or lower (2) Mode 2: Step 5 or lower (3) Mode 3: Step 4 or lower	■ Use the "External control adaptor for outdoor unit". Set to "External control adaptor for outdoor unit" with No. 12 of "Setting mode 2" and select the mode with No. 25. If necessary, set the "Capacity precedence setting" to ON with No. 29.
		B. The low noise operation aforementioned is enabled in night-time automatic low noise operation mode. Start time: Possible to select in the range of 20:00 to 24:00 hours. End time: Possible to select in the range of 06:00 to 08:00 hours. (Use the said time as a guide since the start time and the end time are estimated according to outdoor temperatures.)	■ Make this setting while in "Setting mode 2". Select a mode with No. 22 of "Setting mode 2". Select the start time with No. 26 and the end time with No. 27. If necessary, set the "Capacity precedence setting" to ON with No. 29.
3	Setting of demand operation (*1)	■ Used to place limits on the compressor operating frequency to control the upper limit of power consumption. (1) Mode 1 of Demand 1: 60% or less of rating (2) Mode 2 of Demand 1: 70% or less of rating (3) Mode 3 of Demand 1: 80% or less of rating (4) Demand 2: 40% or less of rating (5) Demand 3: Forced thermostat OFF	■ Method using the external control adaptor for outdoor unit. Select Demand 1 – 3 by short-circuit the terminal strip (TeS1).
			■ Setting by "Setting mode 2" only Select Demand 1 or Demand 2 using set No. 32 of "Setting mode 2". If Demand 1 is selected, then also select Level 1 – 3 using set No. 30.
4	Setting of AIRNET address	■ Used to make address setting with AIRNET connected.	■ Set the AIRNET to an intended address using binary numbers with No. 13 of "Setting mode 2".
5	Setting of high static pressure	■ Make this setting to operate a system with discharge duct while in high static pressure mode. (Use this setting mode when concealed outdoor unit installation is required on upper floors or balconies.) * In order to mount the discharge duct, remove the cover from the outdoor unit fan.	■ Set No. 18 of "Setting mode 2" to ON.

(2) Service setting items

Setting item		Content and objective of setting	Overview of setting procedure
1	Indoor unit fan forced H operation	■ Used to operate the indoor unit in the stopped state in forced H operation mode.	■ Set No. 5 of "Setting mode 2" to indoor unit forced fan H.
2	Indoor unit forced operation	■ Used to operate the indoor unit in forced operation mode.	■ Set No. 6 of "Setting mode 2" to indoor unit forced operation mode.
3	Change of targeted evaporation temperature (in cooling)	■ In cooling operation, used to change the targeted evaporation temperature for compressor capacity control.	■ Select high side or low side with No. 8 of "Setting mode 2".
4	Change of targeted condensing temperature (in heating)	■ In heating operation, used to change the targeted condensing temperature for compressor capacity control.	■ Select high side or low side with No. 9 of "Setting mode 2".
5	Setting of defrost selection	■ Used to change a temperature at which the defrost operation is initiated, thus making the initiation easy or hard.	■ Select fast side or slow side with No. 10 of "Setting mode 2".
6	Setting of sequential startup	■ Used to start units not in sequence but simultaneously.	■ Set No. 11 of "Setting mode 2" to NONE.
7	Emergency operation	■ If the compressor has a failure, used to prohibit the operation of compressor(s) concerned or outdoor unit(s) concerned and to conduct emergency operation of the system only with operable compressor(s) or outdoor unit(s).	■ Make this setting while in "Setting mode 2". For system with a single outdoor unit: Set with No. 19 or 42. For system with multiple outdoor units: Set with No. 38, 39, or 40.
8	Air tight test	■ Fully open the outdoor unit and indoor unit expansion valves, and turn on some of the solenoid valves.	■ Set No. 21 of "Setting mode 2" to ON.
9	Refrigerant recovery mode	■ Used to recover refrigerant on site. With operations of indoor and outdoor units prohibited, fully open the expansion valve of the indoor and outdoor units.	■ Set No. 21 of "Setting mode 2" to ON.
10	Vacuuming mode	■ Used to conduct vacuuming on site. Fully open the expansion valves of the indoor and outdoor units, and energize some of solenoid valves. Use a vacuum pump to conduct vacuuming.	■ Set No. 21 of "Setting mode 2" to ON.
11	Power transistor check mode	■ Used for the troubleshooting of DC compressors. Inverter waveform output makes it possible to judge whether a malfunction results from the compressor or the PCB.	■ Set No. 28 of "Setting mode 2" to ON.
12	Setting of model with spare PCB	■ In order to replace the PCB by a spare one, be sure to make model setting.	■ For this setting, set the DS2-2, -3, and-4 switches on the PCB to the model concerned.

■ Setting by dip switches

Using dip switches on the PCB enables field setting shown below. However, make no changes of factory settings except for DS1-1.

Dipswitch		Setting item	Description
No.	Setting		
DS1-1	ON	Cool / Heat select	Used to set cool / heat select by Cool/Heat selector equipped with outdoor unit.
	OFF (Factory set)		
DS1-2 ~DS1-4	ON	Not used	Do not change the factory settings.
	OFF (Factory set)		

Setting at replacement by spare PCB

Caution

DIP switch Setting after changing the main PCB(A1P) to spare parts PCB

After the replacement by the spare PCB, be sure to make settings shown below.
When you change the main PCB(A1P) to spare parts PCB, please carry out the following setting.

Initial conditions of dip switches

DIP Switch Detail

DS No.	Item	Contents	
DS1-1	Cool/Heat changeover setting	ON	COOL/HEAT setting is made with the use of a Cool/Heat selector mounted to the outdoor unit.
		OFF (Factory setting of spare PCB)	COOL/HEAT setting is not made with the use of a Cool/Heat selector mounted to the outdoor unit.
DS1-2	Power supply specification	ON	200V class (220V)
		OFF (Factory setting of spare PCB)	400V class (380V)
DS1-3	Cooling only/Heat-pump setting	ON	Cooling only setting
		OFF (Factory setting of spare PCB)	Heat pump setting
DS1-4	Check operation	ON	(1) If check operation was not performed during installation → Do not change the setting. (Leave it OFF.) (2) If check operation was completed or normal operation is in progress → Change the setting (OFF → ON).
		OFF (Factory setting of spare PCB)	
DS2-1	Unit allocation setting (Domestic / Overseas)	ON	Do not change factory setting of the spare part (OFF).
DS2-2		OFF (Factory setting of spare PCB)	
DS2-3	Model setting	Make the following settings according to models of outdoor units.	
DS2-4			

	RQYQ140PY1 RQEQ140PY1	RQYQ180PY1 RQEQ180PY1	RQEQ212PY1
DS2-3	OFF	OFF	ON
DS2-4	OFF	ON	OFF

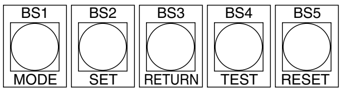
■ Setting by push button switches

The following settings are made by push button switches on PCB.
In case of multi-outdoor unit system, various items should be set with the master unit. (Setting with the slave unit is disabled.)

LED display

		MODE H1P	TEST H2P	COOL/HEAT select			Low noise H6P	Demand H7P	Multi; H8P
				IND H3P	MASTER H4P	SLAVE H5P			
Single-outdoor-unit system		●	●	○	●	●	●	●	●
Outdoor-multi system	Master	●	●	○	●	●	●	●	○
	Slave 1 ~ 4	●	●	●	●	●	●	●	◑

(Factory setting)



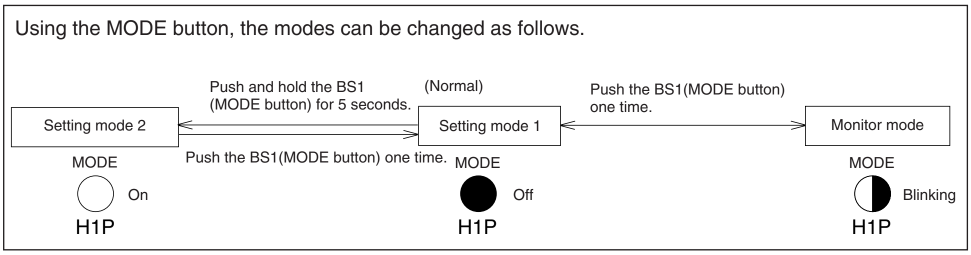
There are the following three setting modes.

① **Setting mode 1 (H1P off)**
Initial status (when normal) : Used to select the cool/heat setting. Also indicates during “abnormal”, “low noise control” and “demand control”.

② **Setting mode 2 (H1P on)**
Used to modify the operating status and to set program addresses, etc. Usually used in servicing the system.

③ **Monitor mode (H1P blinks)**
Used to check the program made in Setting mode 2.

■ Mode changing procedure 1



a. “Setting mode 1”

This mode is used to set and check the following items.

1. Set items ············ In order to make COOL/HEAT selection in a batch of outdoor unit group, change the setting.
   - COOL/HEAT selection (IND) ····················· Used to select COOL or HEAT by individual outdoor unit (factory set).
   - COOL/HEAT selection (MASTER) ············ Used to select COOL or HEAT by outdoor unit group with the master unit.
   - COOL/HEAT selection (SLAVE)················ Used to select COOL or HEAT by outdoor unit group with the slave unit.
2. Check items ······· The following items can be checked.
   (1) Current operating conditions (Normal / Abnormal / In check operation)
   (2) Setting conditions of COOL/HEAT selection (Individual / Batch master / Batch slave)
   (3) Low noise operating conditions (In normal operation / In low noise operation)
   (4) Demand operating conditions (In normal operation / In demand operation)

Procedure for changing COOL/HEAT selection setting

Normally, “Setting mode 1” is set. In case of other status, push MODE (BS1) button one time and set to “Setting mode 1”.

↓

Push the SET (BS2) button to set the blinking of LED to any of conditions shown on the right.

○ ON
● OFF
◑ Blink

Setting (displaying) item	MODE H1P	TEST H2P	COOL/HEAT select IND H3P	COOL/HEAT select MASTER H4P	COOL/HEAT select SLAVE H5P	Low noise H6P	Demand H7P
For selection by individual outdoor unit (factory set)	●	●	◑	●	●	●	●
For selection in a batch of outdoor unit group with master unit	●	●	●	◑	●	●	●
For selection in a batch of outdoor unit group with slave unit	●	●	●	●	◑	●	●

↓

Push the RETURN (BS3) button to determine the setting. → Pushing the RETURN (BS3) button will return the system to the initial condition of "Setting mode 1".

Procedure for checking check items

The system is normally set to "Setting mode 1".
Should the system be set to any mode other than that, push the MODE (BS1) button to set the system to "Setting mode 1".

↓

Check the system for each condition through LED displays. (Refer to information in table on the right.)

↓

Pushing the RETURN (BS3) button will bring the system to the initial state of "Setting mode 1".

MODE H1P	TEST H2P	COOL/HEAT select IND H3P	COOL/HEAT select MASTER H4P	COOL/HEAT select SLAVE H5P	Low noise H6P	Demand H7P
●	●	○	●	●	●	●

- TEST H2P → Current operating conditions
  - ●Normal ○Abnormal
  - ◑In preparation or in check operation
- H3P–H5P → Setting of COOL/HEAT selection
  - ○●● By individual outdoor unit
  - ●○● In a batch of outdoor unit group with master unit
  - ●●○ In a batch of outdoor unit group with slave unit
- H6P → Low noise operating conditions
  - ●In normal operation
  - ○In low noise operation
- H7P → Demand operating conditions
  - ●In normal operation
  - ○In demand operation

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b. “Setting mode 2”

Push and hold the MODE (BS1) button for 5 seconds and set to “Setting mode 2”.

↓

<Selection of setting items>

Push the SET (BS2) button and set the LED display to a setting item shown in the table on the right.

↓

Push the RETURN (BS3) button and decide the item. (The present setting condition is blinked.)

↓

<Selection of setting conditions>

Push the SET (BS2) button and set to the setting condition you want.

↓

Push the RETURN (BS3) button and decide the condition.

↓

Push the RETURN (BS3) button and set to the initial status of “Setting mode 2”.

∗ If you become unsure of how to proceed, push the MODE (BS1) button and return to setting mode 1.

No.	Setting item	Description
0	Digital pressure gauge kit display	Used to make setting of contents to display on the digital pressure gauges (e.g. pressure sensors and temperature sensors)
1	Cool/heat unified address	Sets address for cool/heat unified operation.
2	Low noise/demand address	Address for low noise/demand operation
3	Test operation settings	Used to conduct test operation without making changes to the PCB and replacing the refrigerant, after the completion of maintenance.
5	Indoor unit forced fan H	Allows forced operation of indoor unit fan while unit is stopped. (H tap)
6	Indoor unit forced operation	Allows forced operation of indoor unit.
8	Te setting	Target evaporation temperature for cooling
9	Tc setting	Target condensation temperature for heating
10	Defrost changeover setting	Changes the temperature condition for defrost and sets to quick defrost or slow defrost.
11	Sequential operation setting	Sets sequential operation (Factory set to ON)
12	External low noise setting / Demand setting	Reception of external low noise or demand signal
13	AIRNET address	Set address for AIRNET.
16	Setting of hot water	Make this setting to conduct heating operation with hot water heater.
18	High static pressure setting	Make this setting in the case of operating in high static pressure mode with diffuser duct mounted. (In order to mount the diffuser duct, remove the cover from the outdoor unit fan.)
20	Additional refrigerant charge operation setting	Carries out additional refrigerant charge operation.
21	Refrigerant recovery/ vacuuming mode setting	Sets to refrigerant recovery or vacuuming mode.
22	Night-time low noise setting	Sets automatic nighttime low noise operation in a simple way. The operating time is based on “Starting set” and “Ending set”.
25	Setting of external low noise level	Sets low noise level when the low noise signal is input from outside.
26	Night-time low noise operation start setting	Sets starting time of nighttime low noise operation. (Night-time low noise setting is also required.)
27	Night-time low noise operation end setting	Sets ending time of nighttime low noise operation. (Night-time low noise setting is also required.)
28	Power transistor check mode ∗Check after disconnection of compressor wires	Used for trouble diagnosis of DC compressor. Since the waveform of inverter is output without wiring to the compressor, it is convenient to probe whether the trouble comes from the compressor or PCB.
29	Capacity precedence setting	If the capacity control is required, the low noise control is automatically released by this setting during carrying out low noise operation and nighttime low noise operation.
30	Demand setting 1	Changes target value of power consumption when demand control 1 is input.
32	Normal demand setting	Normally enables demand control 1 without external input. (Effective to prevent a problem that circuit breaker of small capacity is shut down due to large load.)

No.	Setting item	Description
35	Setting of difference in elevation for the outdoor unit	Make the setting when the outdoor unit is installed 40 m or more below the indoor unit.
38	Emergency operation (Setting for the master unit operation prohibition in multi-outdoor-unit system)	Used to temporarily prohibit the applicable outdoor unit from operating should there be any faulty part in multi-outdoor-unit system. Since the comfortable environment is extremely impaired, prompt replacement of the part is required.
39	Emergency operation (Setting for the slave unit 1 and 2 operation prohibition in multi-outdoor-unit system)	
40	Emergency operation (Setting for the slave unit 3 operation prohibition in multi-outdoor-unit system)	
51	Master-slave set-up for multi outdoor units	Set up master and slave units for multi-connection outdoor units. After setting up, press the BS5 (RESET) button for 5 seconds or more.

The numbers in the "No." column represent the number of times to press the SET (BS2) button.

No.	Setting item	MODE H1P	TEST H2P	IND H3P	Master H4P	Slave H5P	Low noise H6P	Demand H7P	Setting condition display			✻ Factory set
		Setting item display		C/H selection								
0	Digital pressure gauge kit display	○	●	●	●	●	●	●	Address	0	○●●●●●●	✻
									Binary number	1	○●●●●●○	
									(4 digits)		~	
										15	○●●○○○○	
1	Cool / Heat Unified address	○	●	●	●	●	●	○	Address	0	○●●●●●●	✻
									Binary number	1	○●●●●●○	
									(6 digits)		~	
										31	○●○○○○○	
2	Low noise/demand address	○	●	●	●	●	○	●	Address	0	○●●●●●●	✻
									Binary number	1	○●●●●●○	
									(6 digits)		~	
										31	○●○○○○○	
3	Test operation	○	●	●	●	●	○	○	Test operation: OFF		○●●●●●○	✻
									Test operation: ON		○●●●●○●	
5	Indoor forced fan H	○	●	●	●	○	●	○	Normal operation		○●●●●●○	✻
									Indoor forced fan H		○●●●●○●	
6	Indoor forced operation	○	●	●	●	○	○	●	Normal operation		○●●●●●○	✻
									Indoor forced operation		○●●●●○●	
8	Te setting	○	●	●	○	●	●	●	Low (Level L)		○●●●●●○	
									Normal (Level M)		○●●●●○●	✻
									High① (Level H)		○●●●●○○	
									High② (Level H)		○●●●○●●	
									High③ (Level H)		○●●●○●○	
									High④ (Level H)		○●●●○○●	
									High⑤ (Level H)		○●●●○○○	
9	Tc setting	○	●	●	○	●	●	○	Low		○●●●●●○	
									Normal (factory setting)		○●●●●○●	✻
									High		○●●●○●●	
10	Defrost changeover setting	○	●	●	○	●	○	●	Slow defrost		○●●●●●○	
									Normal (factory setting)		○●●●●○●	✻
									Quick defrost		○●●●○●●	
11	Sequential operation setting	○	●	●	○	●	○	○	OFF		○●●●●●○	
									ON		○●●●●○●	✻
12	External low noise/ demand setting	○	●	●	○	○	●	●	External low noise/demand: NO		○●●●●●○	✻
									External low noise/demand: YES		○●●●●○●	
13	AIRNET address	○	●	●	○	○	●	○	Address	0	○●●●●●●	✻
									Binary number	1	○●●●●●○	
									(6 digits)		~	
										63	○○○○○○○	
16	Setting of hot water heater	○	●	○	●	●	●	●	OFF		○●●●●●○	✻
									ON		○●●●●○●	
18	High static pressure setting	○	●	○	●	●	○	●	High static pressure setting: OFF		○●●●●●○	✻
									High static pressure setting: ON		○●●●●○●	
20	Additional refrigerant charging operation setting	○	●	○	●	○	●	●	Refrigerant charging: OFF		○●●●●●○	✻
									Refrigerant charging: ON		○●●●●○●	
21	Refrigerant recovery/vacuuming mode setting	○	●	○	●	○	●	○	Refrigerant recovery / vacuuming: OFF		○●●●●●○	✻
									Refrigerant recovery / vacuuming: ON		○●●●●○●	

No.	Setting item	Setting item display							Setting condition display		
		MODE H1P	TEST H2P	C/H selection			Low noise H6P	Demand H7P			✻ Factory set
				IND H3P	Master H4P	Slave H5P					
22	Night-time low noise setting	○	●	○	●	○	○	●	OFF	○●●●●●●	✻
									Level 1 (outdoor fan with 6 step or lower)	○●●●●●○	
									Level 2 (outdoor fan with 5 step or lower)	○●●●●○●	
									Level 3 (outdoor fan with 4 step or lower)	○●●●●○○	
25	Low noise setting	○	●	○	○	●	●	○	Level 1 (outdoor fan with 6 step or lower)	○●●●●●○	
									Level 2 (outdoor fan with 5 step or lower)	○●●●●○●	✻
									Level 3 (outdoor fan with 4 step or lower)	○●●●○●●	
26	Night-time low noise operation start setting	○	●	○	○	●	○	●	About 20:00	○●●●●●○	
									About 22:00 (factory setting)	○●●●●○●	✻
									About 24:00	○●●●○●●	
27	Night-time low noise operation end setting	○	●	○	○	●	○	○	About 6:00	○●●●●●○	
									About 7:00	○●●●●○●	
									About 8:00 (factory setting)	○●●●○●●	✻
28	Power transistor check mode	○	●	○	○	○	●	●	OFF	○●●●●●○	✻
									ON	○●●●●○●	
29	Capacity precedence setting	○	●	○	○	○	●	○	OFF	○●●●●●○	✻
									ON	○●●●●○●	
30	Demand setting 1	○	●	○	○	○	○	●	60 % demand	○●●●●●○	
									70 % demand	○●●●●○●	✻
									80 % demand	○●●●○●●	
32	Normal demand setting	○	○	●	●	●	●	●	OFF	○●●●●●○	✻
									ON	○●●●●○●	
35	Setting of difference in elevation for the outdoor unit	○	○	●	●	●	○	○	Normal	○●●●●●●	
									65 m or less	○●●●○●○	
38	Emergency operation (Master unit with multi-outdoor-unit system is inhibited to operate.)	○	○	●	●	○	○	●	OFF	○●●●●●○	✻
									Master unit operation: Inhibited	○●●●●○●	
39	Emergency operation (Slave unit 1 and 2 with multi-outdoor-unit system is inhibited to operate.)	○	○	●	●	○	○	○	OFF	○●●●●●○	✻
									Slave unit 1 operation: Inhibited	○●●●●○●	
40	Emergency operation (Slave unit 3 with multi-outdoor-unit system is inhibited to operate.)	○	○	●	○	●	●	●	OFF	○●●●●●○	✻
									Slave unit 2 operation: Inhibited	○●●●●○●	
51	Master-slave set-up for multi outdoor units	○	○	○	●	●	○	○	Automatic judgement	○●●●●●●	✻
									Master	○●●●●●○	
									Slave 1	○●●●●○●	
									Slave 2	○●●●●○○	
									Slave 3	○●●●○●●	

c. Monitor mode

To enter the monitor mode, push the MODE (BS1) button when in "Setting mode 1".

↓

<Selection of setting item>

Push the SET (BS2) button and set the LED display to a setting item.

↓

<Confirmation on setting contents>

Push the RETURN (BS3) button to display different data of set items.

↓

Push the RETURN (BS3) button and switches to the initial status of "Monitor mode".

∗ Push the MODE (BS1) button and returns to "Setting mode 1".

No.	Setting item	LED display							Data display
		H1P	H2P	H3P	H4P	H5P	H6P	H7P	
0	Various settings	◐	●	●	●	●	●	●	Lower 4 digits
1	C/H unified address	◐	●	●	●	●	●	○	Lower 6 digits
2	Low noise/demand address	◐	●	●	●	●	○	●	
4	AIRNET address	◐	●	●	●	○	●	●	
5	Number of connected indoor units *1	◐	●	●	●	○	●	○	
6	Number of connected BS units *2	◐	●	●	●	○	○	●	
7	Number of connected zone units (Fixed to "0")	◐	●	●	●	○	○	○	
8	Number of outdoor units *3	◐	●	●	○	●	●	●	
9	Number of BS units *4	◐	●	●	○	●	●	○	Lower 4 digits: upper
10	Number of BS units *4	◐	●	●	○	●	○	●	Lower 4 digits: lower
11	Number of zone units	◐	●	●	○	●	○	○	Lower 6 digits
12	Number of terminal units *5	◐	●	●	○	○	●	●	Lower 4 digits: upper
13	Number of terminal units *5	◐	●	●	○	○	●	○	Lower 4 digits: lower
14	Contents of malfunction (the latest)	◐	●	●	○	○	○	●	Malfunction code table Refer to P. 106 ~ 109
15	Contents of malfunction (1 cycle before)	◐	●	●	○	○	○	○	
16	Contents of malfunction (2 cycle before)	◐	●	○	●	●	●	●	
20	Contents of retry (the latest)	◐	●	○	●	○	●	●	
21	Contents of retry (1 cycle before)	◐	●	○	●	○	●	○	
22	Contents of retry (2 cycle before)	◐	●	○	●	○	○	●	
25	Number of multi connection outdoor units	◐	●	○	○	●	●	○	Lower 6 digits

The numbers in the "No." column represent the number of times to press the SET (BS2) button.

*1: Number of connected indoor units
Used to make setting of the number of indoor units connected to an outdoor unit.

*2: Number of connected BS units
Used to make setting of the number of BS units connected to an outdoor unit.

*3: Number of outdoor units
Used to make setting of the number of outdoor units connected to DIII-NET that is one of the communication lines.

*4: Number of BS units
Used to make setting of the number of BS units connected to DIII-NET that is one of the communication lines.

*5: Number of terminal units
Used to make setting of the number of indoor units connected to DIII-NET that is one of the communication lines.
(Only available for VRV indoor units)

Setting item 0 Display contents of "Number of units for various settings"

EMG operation / backup operation setting	ON	◑	●	●	○	●	●	●
	OFF	◑	●	●	●	●	●	●
Defrost select setting	Short	◑	●	●	●	○	●	●
	Medium	◑	●	●	●	◑	●	●
	Long	◑	●	●	●	●	●	●
Te setting	L	◑	●	●	●	●	●	●
	M	◑	●	●	●	●	◑	●
	H ①~⑤	◑	●	●	●	●	○	●
Tc setting	L	◑	●	●	●	●	●	●
	M	◑	●	●	●	●	●	◑
	H	◑	●	●	●	●	●	○

★ Data such as addresses and number of units is expressed as binary numbers; the two ways of expressing are as follows:

◑ ● ◑ ● ◑ ◑ ●
16 4 1
32 8 2

The No. 1 cool/heat unified address is expressed as a binary number consisting of the lower 6 digits. (0 - 63)

In ① the address is 010110 (binary number), which translates to 16 + 4 + 2 = 22 (base 10 number). In other words, the address is 22.

◑ ● ● ● ◑ ● ◑
64 16
No.12 128 32

◑ ● ● ● ◑ ◑ ●
4 1
No.13 8 2

The number of terminal blocks for No. 12 and 13 is expressed as an 8-digit binary number, which is the combination of four upper, and four lower digits for No. 12 and 13 respectively. (0 - 128)
In ② the address for No. 12 is 0101, the address for No. 13 is 0110, and the combination of the two is 01010110 (binary number), which translates to 64 + 16 + 4 + 2 = 86 (base 10 number). In other words, the number of terminal block is 86.

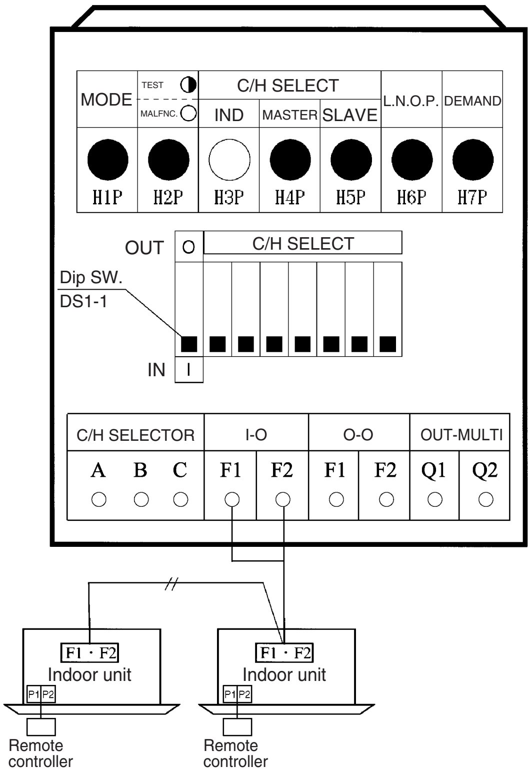
★ See the preceding page for a list of data, etc. for No. 0 - 25.

2.1.2 Cool / Heat Mode Switching

There are the following 4 cool/heat switching modes.
① Set cool/heat separately for each outdoor unit system by indoor unit remote controller.
② Set cool/heat separately for each outdoor unit system by cool/heat selector.
③ Set cool/heat for more than one outdoor unit system simultaneously in accordance with unified master outdoor unit by indoor unit remote controller.
④ Set cool/heat for more than one outdoor unit system simultaneously in accordance with unified master outdoor unit by cool/heat switching remote controller.
⑤ Set cool/heat at all outdoor unit systems simultaneously for each outdoor unit external control adaptor by using the centralized remote controller.

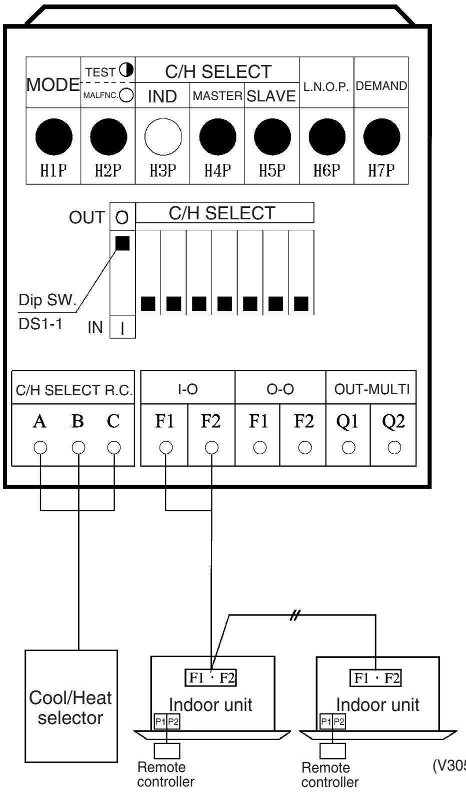
① Set Cool / Heat Separately for Each Outdoor Unit System by Indoor Unit Remote Controller

- It does not matter whether or not there is outdoor - outdoor unit wiring.
- Set outdoor unit PCB DS1-1 to IN (factory set).
- Set cool/heat switching to IND (individual) for "Setting mode 1" (factory set).



② Set Cool / Heat Separately for Each Outdoor Unit System by Cool / Heat Selector

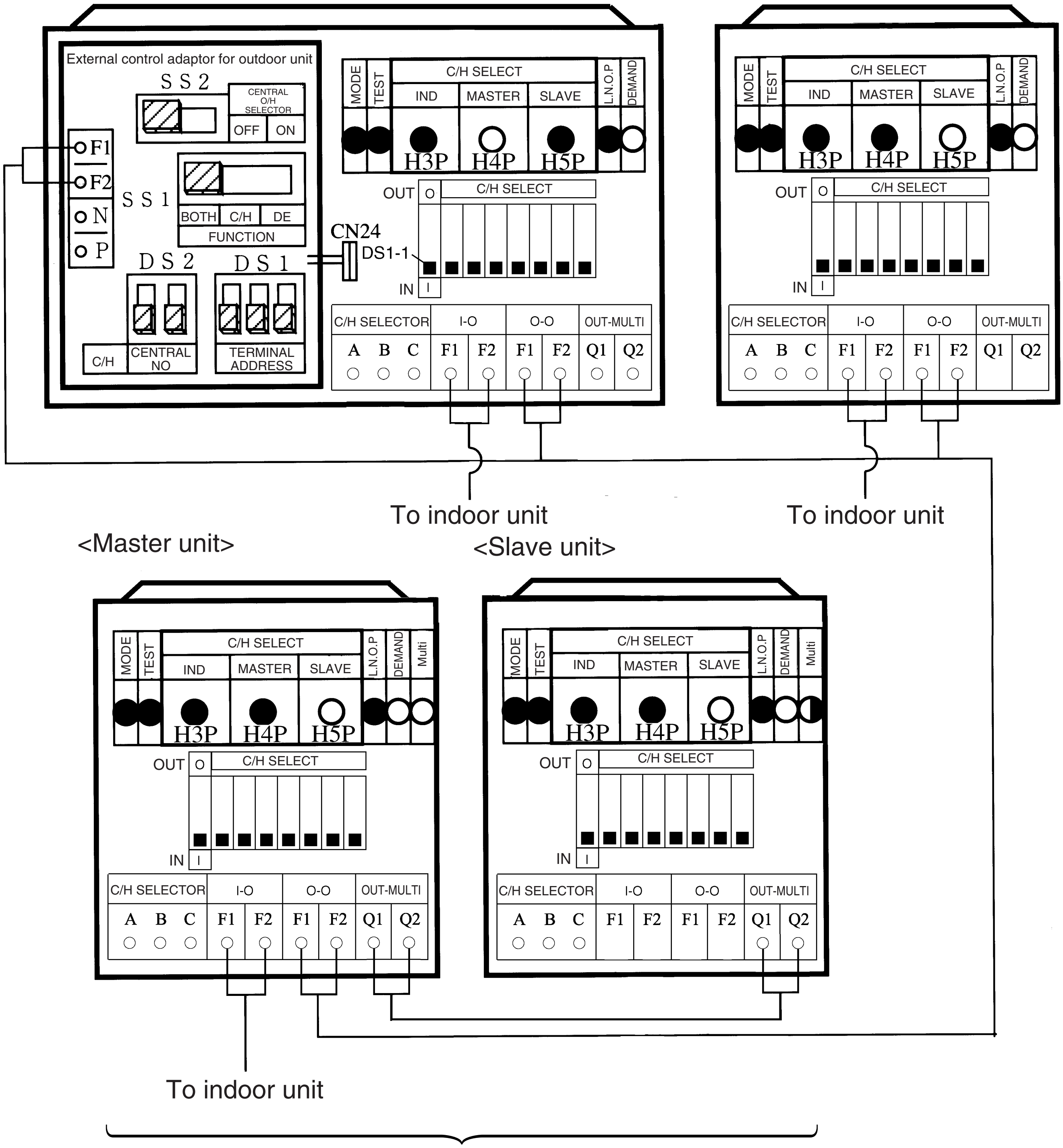
- ◆ It does not matter whether or not there is outdoor - outdoor unit wiring.
- ◆ Set outdoor unit PCB DS1-1 to OUT (factory set).
- ◆ Set cool/heat switching to IND (individual) for "Setting mode 1" (factory set).



(V3059)

③ Set Cool / Heat for More Than One Outdoor Unit System Simultaneously in Accordance with Unified Master Outdoor Unit by Indoor Unit Remote Controller

- Install the external control adaptor for outdoor unit on either the outdoor-outdoor, indoor-outdoor transmission line.
- Set outdoor unit PCB DS1-1 to IN (factory set).
- In setting mode 1, set the outdoor unit you want to give cool/heat selection permission to as the group master, and set the other outdoor units as group slave units.
- Set the outdoor unit external control adaptor SS1 to BOTH (factory set) or C/H, and SS2 to OFF (factory set).

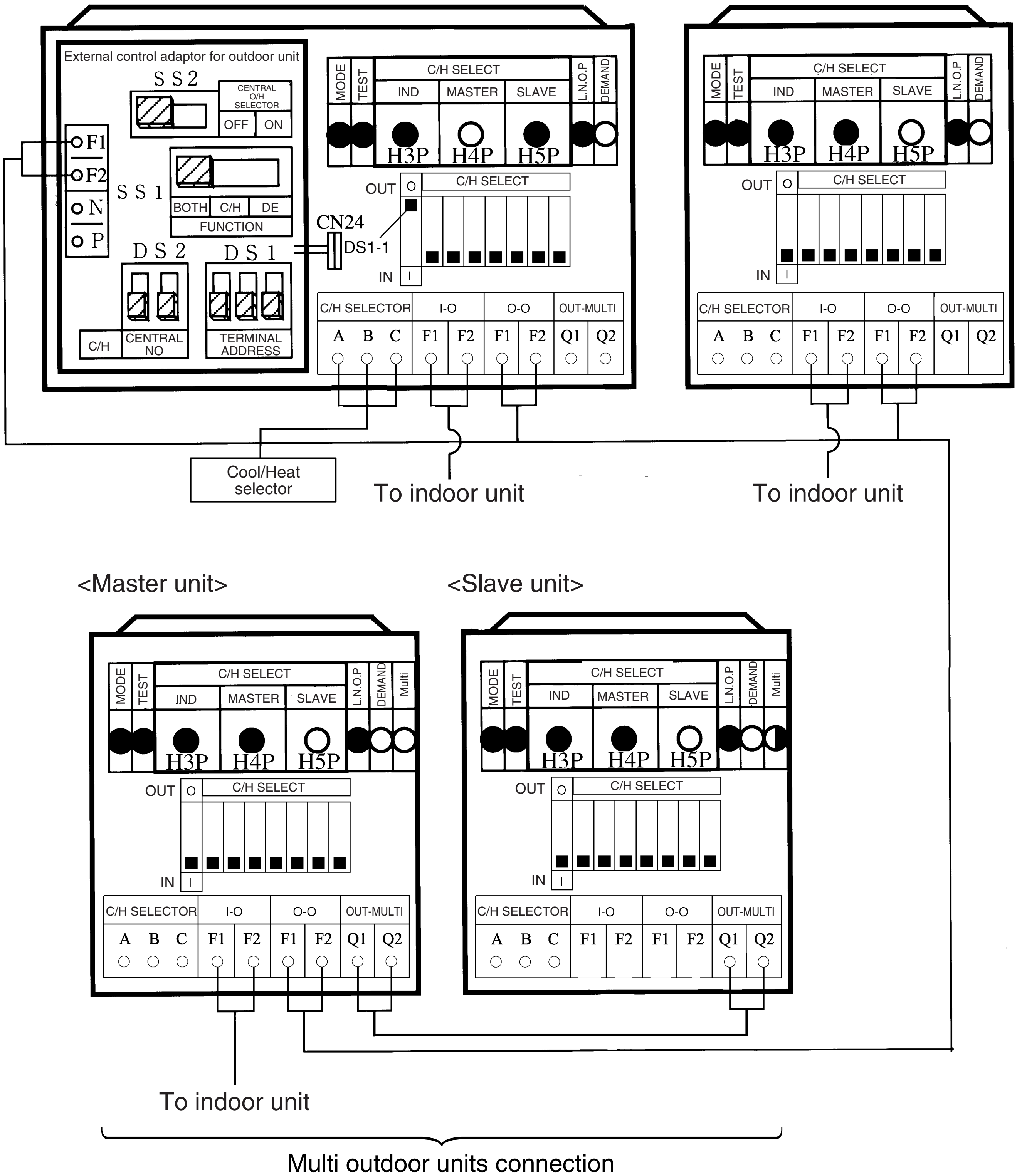


Multi outdoor units connection

- When multiple external control adaptors are used and cool / heat is selected for each external control adaptor, use “setting mode 2” and set DS1 and DS2 on the external control adaptors and the unified cool / heat address on the outdoor unit main PCB to the same address No. (For details, refer to the following page.)

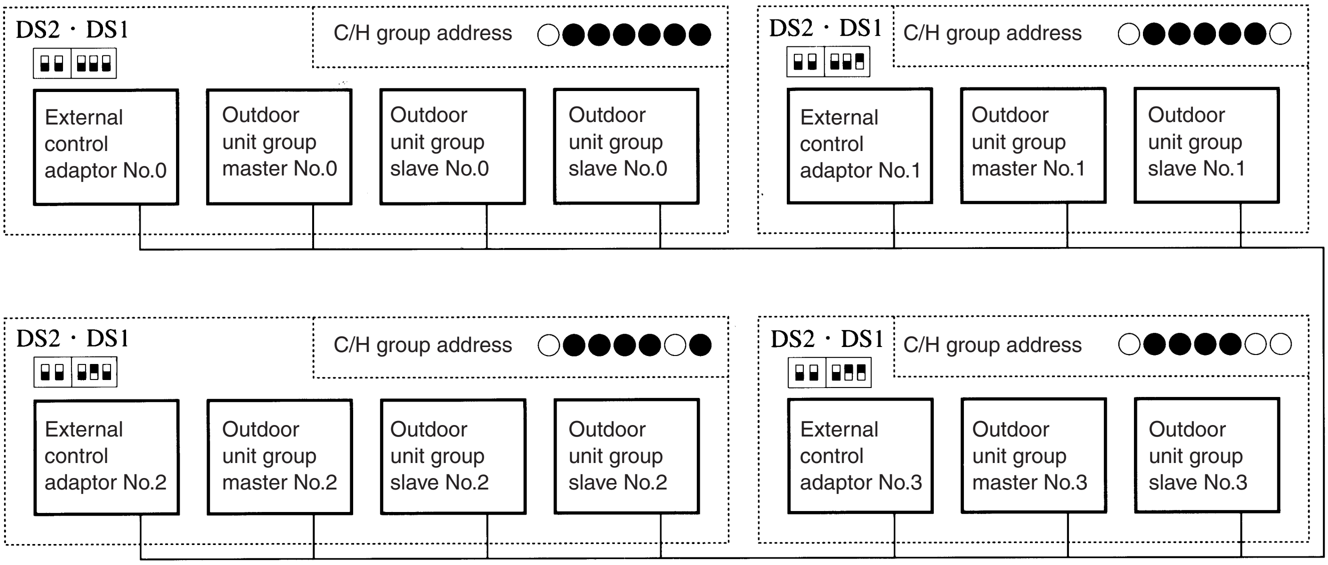
④ **Set Cool / Heat for More Than One Outdoor Unit System Simultaneously in Accordance with Unified Master Outdoor Unit by Cool / Heat Selector**

- Install the external control adaptor for outdoor unit on either the outdoor-outdoor, indoor-outdoor transmission line.
- Mount the COOL/HEAT selector to the master outdoor unit for the unified control.
- Set the DS1-1 on the PCB of master outdoor unit to OUT.
- In setting mode 1, set the outdoor unit you want to give cool/heat selection permission to as the group master, and set the other outdoor units as group slave units.
- When multiple external control adaptors are used and cool / heat is selected for each external control adaptor, use "setting mode 2" and set DS1 and DS2 on the external control adaptors and the unified cool / heat address on the outdoor unit main PCB to the same address No. (For details, refer to the following page.).



Supplementation on ③ and ④.

When switching cool/heat for each adaptor PCB with the use of more than one adaptor PCB, set the address of the external control adaptor for outdoor unit PCB DS1 and DS2 so that it matches the unified cool/heat address of outdoor unit main PCB.



Address setting for ③ and ④ (Set lower 5 digits with binary number.) [No.0 to No.31]

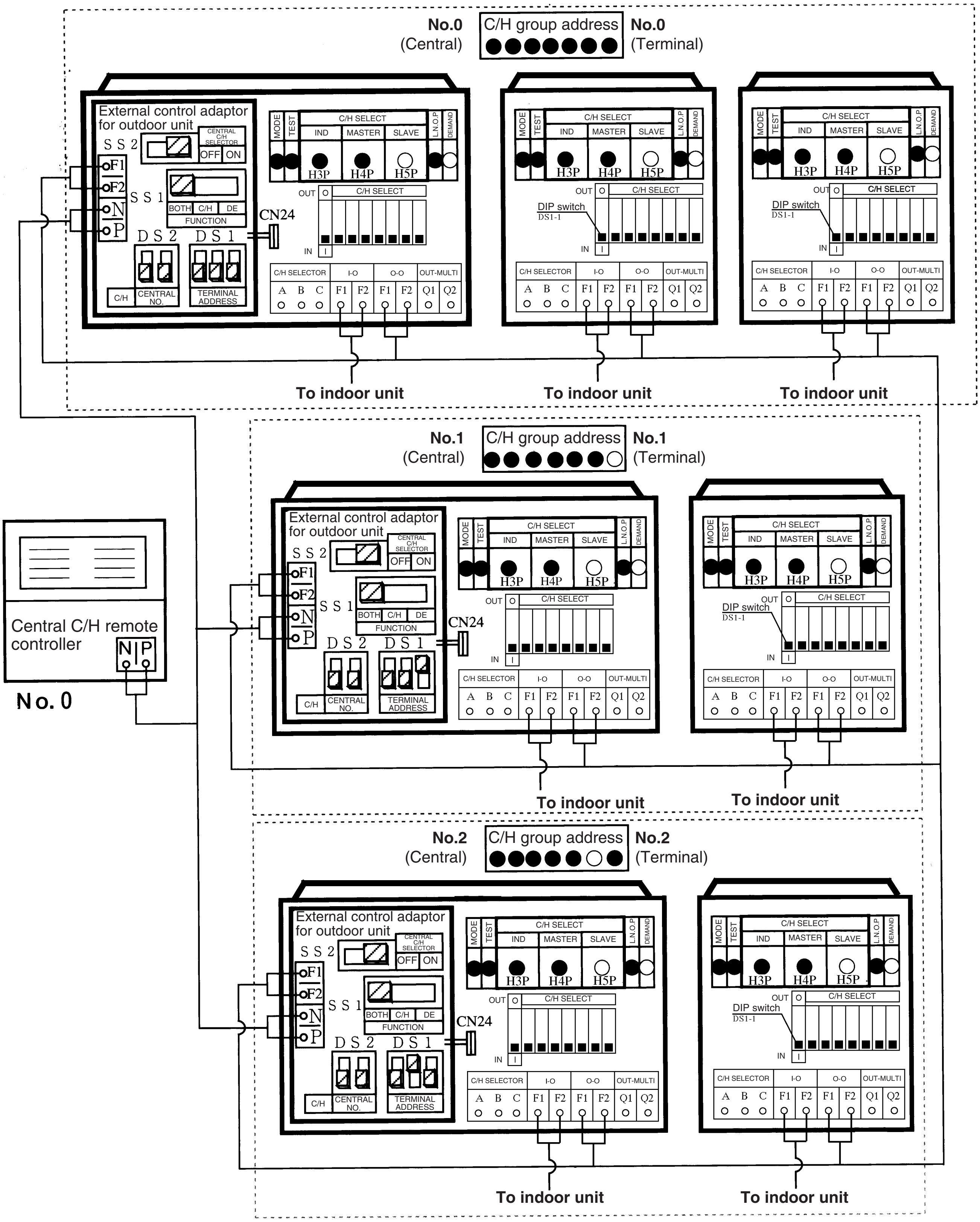
Address No.	Outdoor unit PCB LED Set with setting mode 2	External control adaptor for outdoor unit DS2 DS1
No 0	○● ●●●●● 0	0
No 1	○● ●●●●○ 1	1
No 2	○● ●●●○● 2	2
No 3	○● ●●●○○ 3	3
No 4	○● ●●○●● 4	4
≀	≀	≀
No 30	○● ●●●●○ 30	30
No 31	○● ○○○○○ 31	31

○ ON ● OFF Upper position (ON) lower position (OFF)

(The shaded part shows knob)

⑤ Set cool/heat at all outdoor unit systems simultaneously for each outdoor unit external control adaptor by using the centralized remote controller.

- ◆ Install the outdoor unit external control adaptor (optional accessory) onto the outdoor-outdoor, indoor-outdoor, or indoor-indoor transmission line.
- ◆ Use "setting mode 1" and set all outdoor units to SLAVE.
- ◆ Set the outdoor unit external control adaptor SS1 to BOTH (factory set) or C/H and set SS2 to ON.
- ◆ Use "setting mode 2" and set DS1 and DS2 on the outdoor unit external control adaptors and the unified heat/cool address on the outdoor unit main PCB to the same address. (The factory set addresses are all "0".)

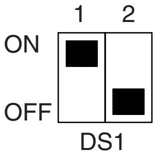


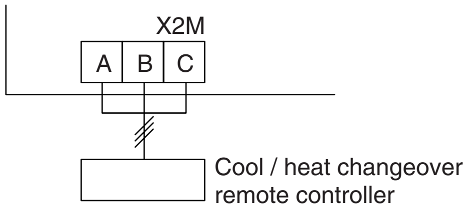
2.1.3 Cool/Heat Changeover Setting [For RQCEP Type]

● To use a cool/heat changeover remote controller

① Set the dip switch on the BS unit PCB (DS 1-1) according to the following before turning on the BS unit.

② Connect the cool/heat changeover remote controller to (A), (B) and (C) of the terminal strip X2M.



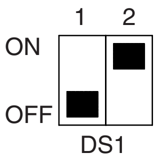


Note:
- This setting is read by a micro-computer when the power is turned on.
- Be sure to set the switch before turning on the power.
- Be sure to close the EL. COMPO. BOX lid after setting.

● To use a cool/heat centralized remote controller

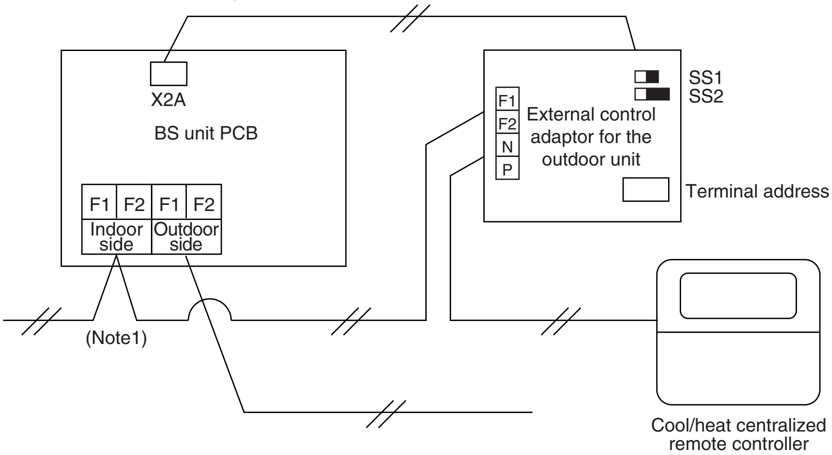
"External control adaptor for the outdoor unit" is required to use a cool/heat centralized remote controller.

① Set the dip switch on the BS unit PCB (DS 1-2) according to the following before turning on the BS unit.

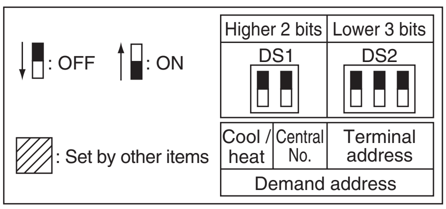


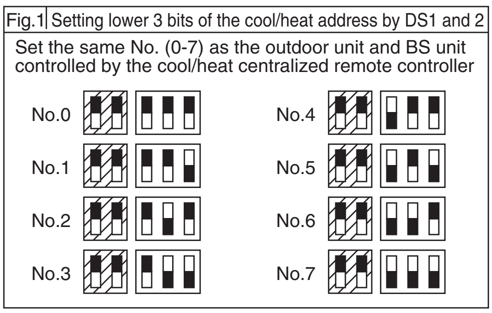
② Connect the connector of the "External control adaptor for the outdoor unit" to the connector (X2A) on the BS unit PCB (Refer to the installation manual and the installation guide for details of the installation).

③ Connect the terminals (F1, F2) of the external control adaptor for the outdoor unit to the terminals (F1, F2: indoor side) on the BS unit PCB (Refer to the figure below).



④ Set the external control adaptor for the outdoor unit according to the following:
- Set SS1 of the external control adaptor for the outdoor unit to "BOTH" or "C/H".
- Set SS2 of the external control adaptor for the outdoor unit to "ON".
- A unit No. of the cool/heat centralized remote controller can be set by setting the terminal address of the external control adaptor for the outdoor unit to 0-7.





2.1.4 Setting of Low Noise Operation and Demand Operation

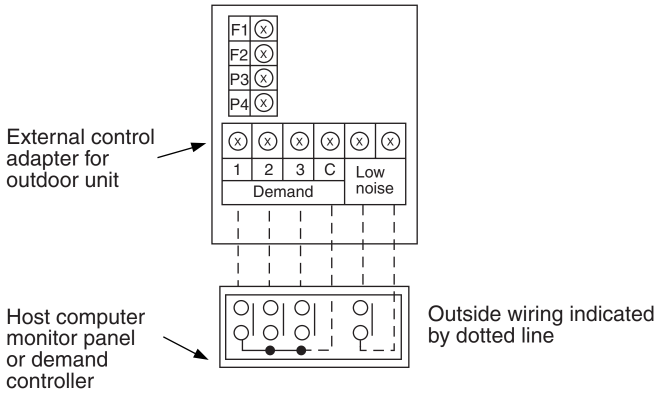
Setting of Low Noise Operation

By connecting the external contact input to the low noise input of the outdoor unit external control adaptor (optional), you can lower operating noise by 2-3 dB.

Setting	Content
Mode 1	Set the outdoor unit fan to Step 6 or lower.
Mode 2	Set the outdoor unit fan to Step 5 or lower.
Mode 3	Set the outdoor unit fan to Step 4 or lower.

A. When the low noise operation is carried out by external contact (with the use of the external control adaptor for outdoor unit)

1. Connect external control adaptor for outdoor unit and short-circuit terminal of low noise (Refer below figure).
   If carrying out demand or low-noise input, connect the adaptor's terminals as shown below.



2. While in "Setting mode 2", set the setting condition for set item No. 12 (Setting of external low noise/demand operation) to "YES".
3. If necessary, while in "Setting mode 2", select the setting condition (i.e., "Mode 1", "Mode 2", or "Mode 3") for set item No. 25 (Setting of external low noise level).
4. If necessary, while in "Setting mode 2", set the setting condition for the set item No. 29 (Setting of capacity precedence) to "ON".
   (If the condition is set to "ON", when the air-conditioning load reaches a high level, the low noise operation command will be ignored to put the system into normal operation mode.)

B. When the low noise operation is carried out automatically at night (The external control adaptor for outdoor unit is not required)

1. While in "Setting mode 2", select the setting condition (i.e., "Mode 1", "Mode 2", or "Mode 3") for set item No. 22 (Setting of nighttime low noise level).
2. If necessary, while in "Setting mode 2", select the setting condition (i.e., "20:00", "22:00", or "24:00") for set item No. 26 (Setting of start time of nighttime low noise operation).
   (Use the start time as a guide since it is estimated according to outdoor temperatures.)
3. If necessary, while in "Setting mode 2", select the setting condition (i.e., "06:00", "07:00", or "08:00") for set item No. 27 (Setting of end time of nighttime low noise operation).
   (Use the end time as a guide since it is estimated according to outdoor temperatures.)
4. If necessary, while in "Setting mode 2", set the setting condition for set item No. 29 (Setting of capacity precedence) to "ON".
   (If the condition is set to "ON", when the air-conditioning load reaches a high level, the system will be put into normal operation mode even during nighttime.)

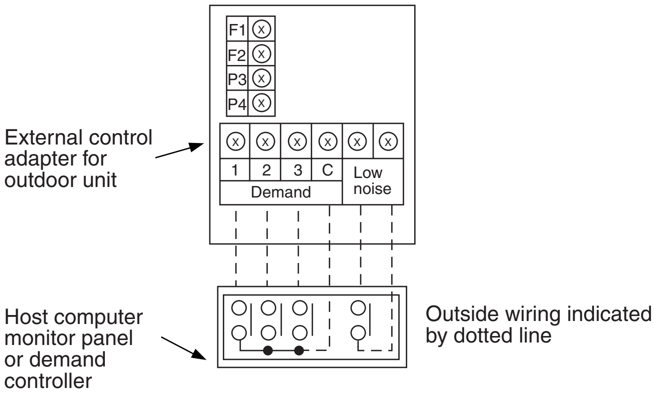
2.1.5 Setting of Demand Operation

By connecting the external contact input to the demand input of the outdoor unit external control adaptor (optional), the power consumption of unit operation can be saved suppressing the compressor operating condition.

Setting content			Setting method	
Set item	Condition	Content	External control adaptor	Outdoor unit PCB
Demand 1	Mode 1	The compressor operates at approx. 60% or less of rating.	Short circuit "1" and "C" on the terminal strip (TeS1).	Set item No. 32 to "Demand 1", and item No. 30 to "Level 1".
	Mode 2	The compressor operates at approx. 70% or less of rating.		Set item No. 32 to "Demand 1", and item No. 30 to "Level 2".
	Mode 3	The compressor operates at approx. 80% or less of rating.		Set item No. 32 to "Demand 1", and item No. 30 to "Level 3".
Demand 2	—	The compressor operates at approx. 40% or less of rating.	Short circuit "2" and "C".	Set item No. 32 to "Demand 2".
Demand 3	—	Forced thermostat OFF.	Short circuit "3" and "C".	—

*: However the demand operation does not occur in the following operation modes.
① Startup control ② Oil return operation
③ Defrosting operation ④ Pump-down residual operation

If carrying out demand or low-noise input, connect the adaptor’s terminals as shown below.



A. When the demand operation is carried out by external contact (with the use of the external control adaptor for outdoor unit).

1. Connect external control adaptor for outdoor unit and short-circuit terminals as required (Refer above figure).
2. While in "Setting mode 2", set the setting condition for set item No. 12 (Setting of external low noise/demand operation) to "YES".
3. If necessary, while in "Setting mode 2", select the set item No. 30 (Setting of Demand 1 level) and then set the setting condition to targeted mode.

B. When the normal demand operation is carried out. (Use of the external control adaptor for outdoor unit is not required.)

1. While in "Setting mode 2", make setting of the set item No. 32 (Setting of alternate demand) to "ON".
2. While in "Setting mode 2", select the set item No. 30 (Setting of Demand 1 level) and then set the setting condition to targeted mode.

2.1.6 Air Tight Test Procedure

After internal servicing is performed in the field, perform the air tight test. Fully open the electronic expansion valves of the outdoor unit and indoor unit, and turn on some of the solenoid valves.

[Operation procedure]

① With the system stopped, use "Setting mode 2" and set (A) Refrigerant recovery / vacuuming mode (setting item No. 21) to "ON".
All of the indoor unit and outdoor unit electronic expansion valves fully open and some of the solenoid valves turn on. (H2P blinks to indicate the test operation, and the remote controller displays "Test Operation" and "Under centralized control", thus prohibiting operation.)

② Close the stop valves on the gas side and liquid side, and perform an air tight test at 4.0 MPa.

③ Press the MODE button (BS1) to cancel "Setting mode 2".

<Caution>

<u>Do not turn off the outdoor unit power during the air tight test.</u>

(The solenoid valves will close and the outdoor unit air tight test will not be possible.)

2.1.7 Setting of Refrigerant Recovery Mode

When carrying out the refrigerant collection on site, fully open the respective expansion valve of indoor and outdoor units.
All indoor and outdoor unit’s operation are prohibited.

[Operation procedure]

① In **setting mode 2** with units in stop mode, set “Refrigerant Recovery / Vacuuming mode” to ON. The respective expansion valve of indoor and outdoor units are fully opened and some of solenoid valves open. (H2P turns to display “TEST OPERATION” (blinks), “TEST OPERATION” and “UNDER CENTRALIZED CONTROL” are displayed on the remote controller, and the all indoor / outdoor unit operation is prohibited.
After setting, do not cancel “Setting Mode 2” until completion of refrigerant recovery operation.

② Collect the refrigerant using a refrigerant recovery unit. (See the instruction attached to the refrigerant recovery unit for more detail.)

③ Press Mode button “BS1” once and reset “Setting Mode 2”.

2.1.8 Setting of Vacuuming Mode

In order to perform vacuuming operation on site, fully open the expansion valves of indoor and outdoor units and turn on some solenoid valves.

[Operating procedure]

① With **Setting Mode 2** while the unit stops, set “Refrigerant recovery / Vacuuming mode” to ON. The expansion valves of indoor and outdoor units fully open and some of solenoid valves open.
(H2P blinks to indicate the test operation, and the remote controller displays "Test Operation" and "Under centralized control", thus prohibiting operation.)
After setting, do not cancel “Setting Mode 2” until completion of Vacuuming operation.

② Use the vacuum pump to perform vacuuming operation.

③ Press Mode button “BS1” once and reset “Setting Mode 2”.

2.1.9 Emergency Operation

If the compressor cannot operate, this control inhibits any applicable compressor or outdoor unit from operating to perform emergency operation only with the operative compressor or outdoor unit.

[Automatic backup operation]

With multi-outdoor-unit system, if a certain outdoor unit system malfunctions (i.e., the system stops and indoor unit remote controller displays the malfunction), by resetting the indoor unit remote controller, the applicable outdoor unit is inhibited from operating for 8 hours, thus making it possible to perform emergency operation automatically.
However, in the event any of the following malfunctions occurs, automatic backup operation can be performed.

Malfunctions under which automatic backup operation can be performed:
- E3, E4, E5, E7
- F3
- H7, H9
- J2, J3, J5, J6, J7, J9, JA, JC
- L1, L4, L5, L8, L9, LC
- U2, UJ

[Emergency operation with settings in service mode]

∗ "Inhibition of operation" is set with each outdoor unit.

Make the following settings with the master unit. (Setting with the slave unit becomes disabled.)

∗ Discriminate the operating status of the master unit / slave units through the following LED display.

LED display (○:ON ●:OFF ◑:Blink)

	H1P————H7P	H8P	
Master:	●●○●●●●	○	
Slave 1:	●●●●●●●	◑	
Slave 2:	●●●●●●●	◑	(Factory set)
Slave 3:	●●●●●●●	◑	

- In order to set the master unit to operation prohibition mode, set No. 38 of Setting mode 2 to "MASTER OPERATION PROHIBITION".

LED display (○:ON ●:OFF ◑:Blink)

(Procedure)	H1P————H7P	
(1) Press and hold the MODE button (BS1) for a period of 5 seconds or more.	○●●●●●●	
(2) Press the SET button (BS2) 38 times.	○○●●○○●	
(3) Press the RETURN button (BS3) once.	○●●●●●●	(Factory set)
(4) Press the SET button (BS2) once.	○●●●●●◑	
(5) Press the RETURN button (BS3) twice.	○●●●●●●	
(6) Press the MODE button (BS1) once.	●●○●●●●	

- In order to set the slave unit 1 to operation prohibition mode, set No. 39 of Setting mode 2 to "SLAVE 1 OPERATION PROHIBITION".

LED display (○:ON ●:OFF ◑:Blink)

(Procedure)	H1P————H7P	
(1) Press and hold the MODE button (BS1) for a period of 5 seconds or more.	○●●●●●●	
(2) Press the SET button (BS2) 39 times.	○○●●○○○	
(3) Press the RETURN button (BS3) once.	○●●●●●●	(Factory set)
(4) Press the SET button (BS2) once.	○●●●●●◑	
(5) Press the RETURN button (BS3) twice.	○●●●●●●	
(6) Press the MODE button (BS1) once.	●●○●●●●	

- In order to set the slave unit 2 to operation prohibition mode, set No. 39 of Setting mode 2 to "SLAVE 2 OPERATION PROHIBITION".

LED display (○:ON ●:OFF ◑:Blink)

(Procedure)	H1P————H7P	
(1) Press and hold the MODE button (BS1) for a period of 5 seconds or more.	○●●●●●●	
(2) Press the SET button (BS2) 39 times.	○○●●○○○	
(3) Press the RETURN button (BS3) once.	○●●●●●●	(Factory set)
(4) Press the SET button (BS2) twice.	○●●●●◑●	
(5) Press the RETURN button (BS3) twice.	○●●●●●●	
(6) Press the MODE button (BS1) once.	●●○●●●●	

- In order to set the slave unit 3 to operation prohibition mode, set No. 39 of Setting mode 2 to "SLAVE 3 OPERATION PROHIBITION".

LED display (○:ON ●:OFF ◑:Blink)

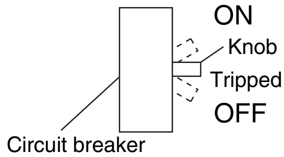
(Procedure)	H1P————H7P	
(1) Press and hold the MODE button (BS1) for a period of 5 seconds or more.	○●●●●●●	
(2) Press the SET button (BS2) 40 times.	○○●○●●●	
(3) Press the RETURN button (BS3) once.	○●●●●●●	(Factory set)
(4) Press the SET button (BS2) once.	○●●●●●◑	
(5) Press the RETURN button (BS3) twice.	○●●●●●●	
(6) Press the MODE button (BS1) once.	●●○●●●●	

*

- In the case of multi-outdoor-unit system, when the above “Inhibition of operation” is set, outdoor unit rotation is not functional.

Part 6
Troubleshooting

1. Symptom-based Troubleshooting

	Symptom		Supposed Cause	Countermeasure
1	The system does not start operation at all.		Blowout of fuse(s)	Turn Off the power supply and then replace the fuse(s).
			Cutout of breaker(s)	• If the knob of any breaker is in its OFF position, turn ON the power supply. • If the knob of any circuit breaker is in its tripped position, do not turn ON the power supply. 
			Power failure	After the power failure is reset, restart the system.
2	The system starts operation but makes an immediate stop.		Blocked air inlet or outlet of indoor or outdoor unit	Remove obstacle(s).
			Clogged air filter(s)	Clean the air filter(s).
3	The system does not cool or heat air well.		Blocked air inlet or outlet of indoor or outdoor unit	Remove obstacle(s).
			Clogged air filter(s)	Clean the air filter(s).
			Enclosed outdoor unit(s)	Remove the enclosure.
			Improper set temperature	Set the temperature to a proper degree.
			Airflow rate set to "LOW"	Set it to a proper airflow rate.
			Improper direction of air diffusion	Set it to a proper direction.
			Open window(s) or door(s)	Shut it tightly.
		[In cooling]	Direct sunlight received	Hang curtains or shades on windows.
		[In cooling]	Too many persons staying in a room	The model must be selected to match the air conditioning load.
		[In cooling]	Too many heat sources (e.g. OA equipment) located in a room	
4	The system does not operate.	The system stops and immediately restarts operation.	If the OPERATION lamp on the remote controller turns ON, the system will be normal. These symptoms indicate that the system is controlled so as not to put unreasonable loads on the system.	Normal operation. The system will automatically start operation after a lapse of five minutes.
		Pressing the TEMP ADJUST button immediately resets the system.		
		The remote controller displays "UNDER CENTRALIZED CONTROL", which blinks for a period of several seconds when the OPERATION button is depressed.	The system is controlled with centralized controller. Blinking display indicates that the system cannot be operated using the remote controller.	Operate the system using the COOL/HEAT centralized remote controller.
		The system stops immediately after turning ON the power supply.	The system is in preparation mode of micro-computer operation.	Wait for a period of approximately one minute.
5	The system makes intermittent stops.	The remote controller displays malfunction codes "U4" and "U5", and the system stops but restarts after a lapse of several minutes.	The system stops due to an interruption in communication between units caused by electrical noises coming from equipment other than air conditioners.	Remove causes of electrical noises. If these causes are removed, the system will automatically restart operation.
6	COOL-HEAT selection is disabled.	The remote controller displays "UNDER CENTRALIZED CONTROL".	This remote controller has no option to select cooling operation.	Use a remote controller with option to select cooling operation.
		The remote controller displays "UNDER CENTRALIZED CONTROL", and the COOL-HEAT selection remote controller is provided.	COOL-HEAT selection is made using the COOL-HEAT selection remote controller.	Use the COOL-HEAT selection remote controller to select cool or heat.

	Symptom		Supposed Cause	Countermeasure
7	The system conducts fan operation but not cooling or heating operation.	This symptom occurs immediately after turning ON the power supply.	The system is in preparation mode of operation.	Wait for a period of approximately 10 minutes.
		"UNDER CENTRALIZED CONTROL" is displayed on the remote controller and the cooling/heating operation stops. The operation switches to the air supply operation.	Even though, the cooling or heating operation is set, the air supply operation continues during thermal storage operation. "UNDER CENTRALIZED CONTROL" is displayed on the remote controller.	Normal operation.
8	The airflow rate is not reproduced according to the setting.	Even pressing the AIRFLOW RATE SET button makes no changes in the airflow rate.	In heating operation, when the room temperature reaches the set degree, the outdoor unit will stop while the indoor unit is brought to fan LL operation so that no one gets cold air. Furthermore, if fan operation mode is selected when other indoor unit is in heating operation, the system will be brought to fan LL operation.	Normal operation.
9	The airflow direction is not reproduced according to the setting.	The airflow direction is not corresponding to that displayed on the remote controller. The flap does not swing.	Automatic control	Normal operation.
10	A white mist comes out from the system.	<Indoor unit> In cooling operation, the ambient humidity is high. (This indoor unit is installed in a place with much oil or dust.)	Uneven temperature distribution due to heavy stain of the inside of the indoor unit	Clean the inside of the indoor unit.
		<Indoor unit> Immediately after cooling operation stopping, the outdoor air temperature and humidity are low.	Hot gas (refrigerant) flown in the indoor unit results to be vapor from the unit.	Normal operation.
		<Indoor and outdoor units> After the completion of defrosting operation, the system is switched to heating operation.	Defrosted moisture turns to be vapor and comes out from the units.	Normal operation.

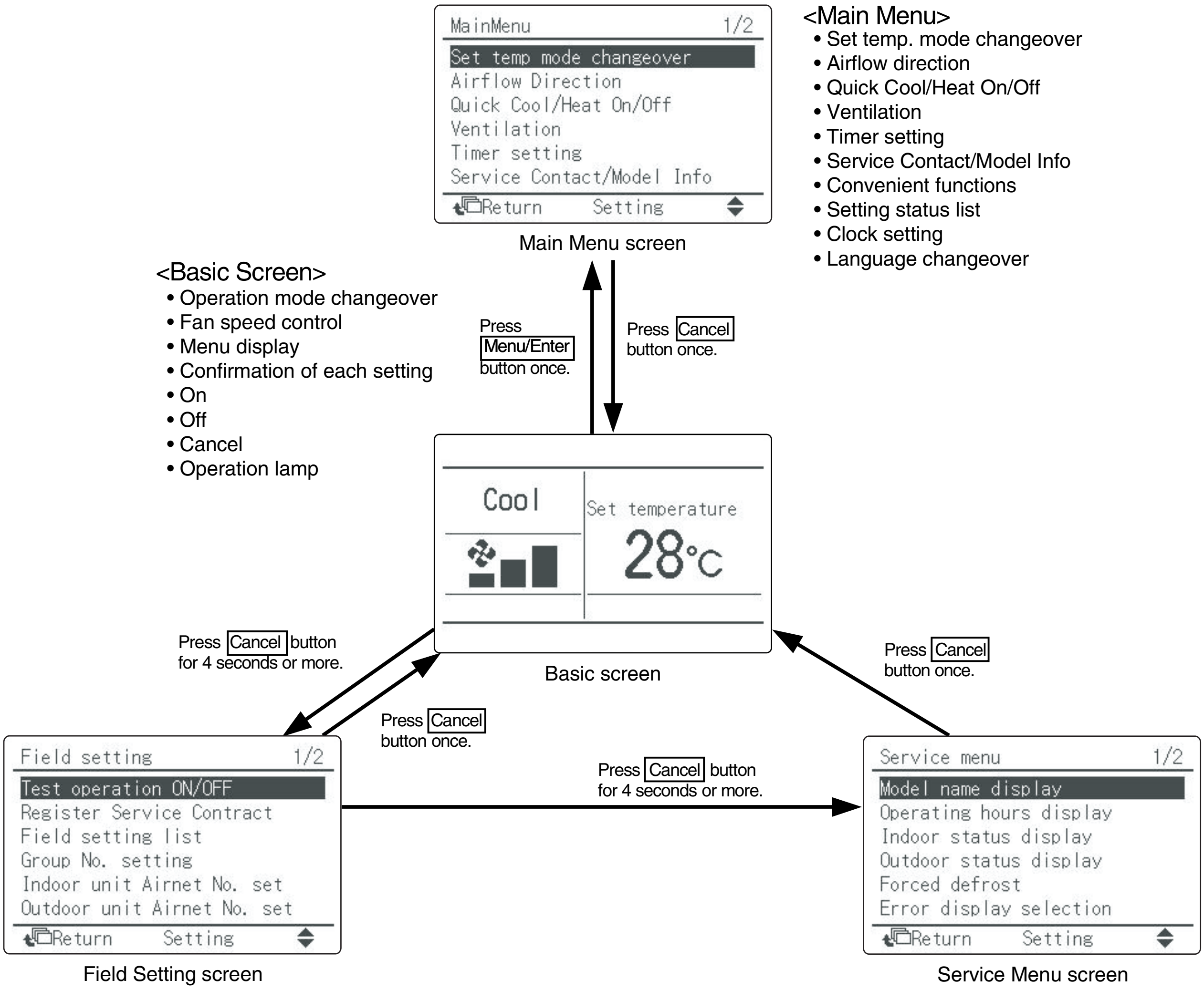
	Symptom		Supposed Cause	Countermeasure
11	The system produces sounds.	<Indoor unit> Immediately after turning ON the power supply, indoor unit produces "ringing" sounds.	These are operating sounds of the electronic expansion valve of the indoor unit.	Normal operation. This sound becomes low after a lapse of approximately one minute.
		<Indoor and outdoor units> "Hissing" sounds are continuously produced while in cooling or defrosting operation.	These sounds are produced from gas (refrigerant) flowing respectively through the indoor and outdoor units.	Normal operation.
		<Indoor and outdoor units> "Hissing" sounds are produced immediately after the startup or stop of the system, or the startup or stop of defrosting operation.	These sounds are produced when the gas (refrigerant) stops or changes flowing.	Normal operation.
		<Indoor unit> Faint sounds are continuously produced while in cooling operation or after stopping the operation.	These sounds are produced from the drain discharge device in operation.	Normal operation.
		<Indoor unit> "Creaking" sounds are produced while in heating operation or after stopping the operation.	These sounds are produced from resin parts expanding and contracting with temperature changes.	Normal operation.
		<Indoor unit> Sounds like "trickling" or the like are produced from indoor units in the stopped state.	On VRV systems, these sounds are produced when other indoor units in operation. The reason is that the system runs in order to prevent oil or refrigerant from dwelling.	Normal operation.
		<Outdoor unit> Pitch of operating sounds changes.	The reason is that the compressor changes the operating frequency.	Normal operation.
12	Dust comes out from the system.	Dust comes out from the system when it restarts after the stop for an extended period of time.	Dust, which has deposited on the inside of indoor unit, is blown out from the system.	Normal operation.
13	Odors come out from the system.	In operation	Odors of room, cigarettes or else adsorbed to the inside of indoor unit are blown out.	The inside of the indoor unit should be cleaned.
14	Outdoor unit fan does not rotate.	In operation	The reason is that fan revolutions are controlled to put the operation to the optimum state.	Normal operation.
15	LCD display "88" appears on the remote controller.	Immediately after turning ON the power supply	The reason is that the system is checking to be sure the remote controller is normal.	Normal operation. This code is displayed for a period of approximately one minute at maximum.
16	The outdoor unit compressor or the outdoor unit fan does not stop.	After stopping operation	It stops in order to prevent oil or refrigerant from dwelling.	Normal operation. It stops after a lapse of approximately 5 to 10 minutes.
17	The outdoor gets hot.	While stopping operation	The reason is that the compressor is warmed up to provide smooth startup of the system.	Normal operation.
18	Hot air comes out from the system even though it stops.	Hot air is felt while the system stops.	On VRV systems, small quantity of refrigerant is fed to indoor units in the stopped state when other indoor units are in operation.	Normal operation.
19	The system does not cool air well.	The system is in dry operation.	The reason is that the dry operation serves not to reduce the room temperature where possible.	Change the system to cooling operation.

2. Troubleshooting by Remote Controller

2.1 The INSPECTION / TEST Button

The following modes can be selected by using the [Inspection/Test Operation] button on the remote control.

On power-up, the message "Connection under check. Please wait for a moment" will be displayed on the remote controller screen. Then that message will disappear and the basic screen will be displayed. To access a mode from the basic screen, refer to the figure below. When any of the operation buttons is pressed, the backlight will come on and remains lit for about 30 seconds. Be sure to press a button while the backlight is on (this does not apply to the ON/OFF button.)



<Main Menu>
- Set temp. mode changeover
- Airflow direction
- Quick Cool/Heat On/Off
- Ventilation
- Timer setting
- Service Contact/Model Info
- Convenient functions
- Setting status list
- Clock setting
- Language changeover

<Basic Screen>
- Operation mode changeover
- Fan speed control
- Menu display
- Confirmation of each setting
- On
- Off
- Cancel
- Operation lamp

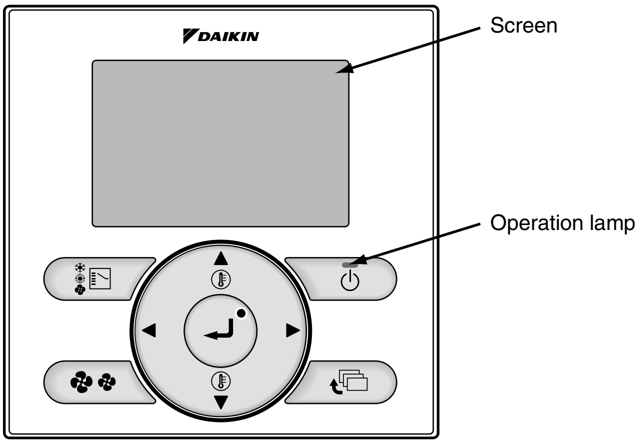
<Field Setting Menu>
- Test operation ON/OFF
- Register Service Contract
- Field setting list
- Group No. setting
- Indoor unit AIRNET No. set
- Outdoor unit AIRNET No. set
- Error record
- Indoor status display
- Outdoor status display
- Fan forced operation ON
- Main/Sub changeover
- Filter element sign OFF

<Service Menu>
- Model name display
- Operating hours display
- Indoor status display
- Outdoor status display
- Forced defrost
- Error display selection
- Unit No. transfer
- Sensor/address data display

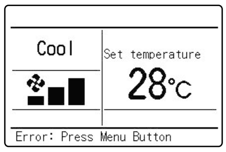
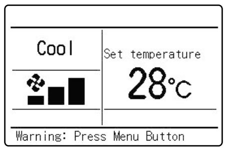
2.2 Self-diagnosis by Wired Remote Controller

Explanation

The following will be displayed on the screen when a malfunction (or a warning) occurs during operation.
Check the malfunction code and take the corrective action specified for the particular model.



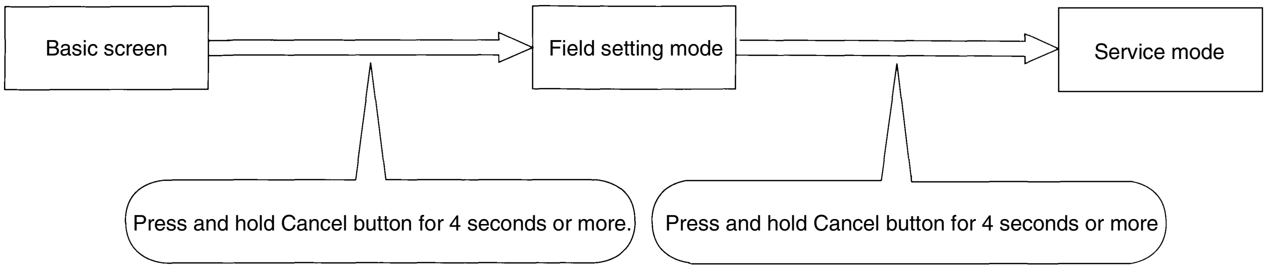
(1) Checking a malfunction or warning

	Operation Status	Display	
Abnormal shutdown	The system stops operating.	The operation lamp (green) starts to blink. The message "Malfunction: Press Menu button" will appear and blink at the bottom of the screen.	
Warning	The system continues its operation.	The operation lamp (green) remains on. The message "Warning: Press Menu button" will appear and blink at the bottom of the screen.	

2.3 Remote Controller Service Mode

Operating the CHECK/TEST button on the remote controller will make it possible to obtain "service data" and change "service setting" while in service mode.

How to Enter the Service Mode



Service Mode Operation Method

1. Select the mode No.

Select the desired item from the Service menu, and then press Menu/Enter button.

2. Select the Item 2.

Select the desired Unit No. using the ▲/▼ (Up/Down) buttons. The corresponding data will be displayed.

For details, refer to the table in next page.

Service Menu	Item 2	Remarks	
1. Model Name Display	1. Unit No.	Select the Unit No. you want to check.	
	2. Indoor unit		
	3. Outdoor unit		
2. Operating Hours Display	1. Unit No.	Select the Unit No. you want to check.	
	2. Indoor unit operating time	All of these are displayed in hours.	
	3. Indoor fan operation		
	4. Indoor unit energized time		
	5. Outdoor operating time		
	6. Outdoor fan 1 operation		
	7. Outdoor fan 2 operation		
	8. Outdoor comp. 1 operation		
	9. Outdoor comp. 2 operation		
3. Indoor Status Display 1/2	1. Unit No.	Select the Unit No. you want to check.	
	2. FAN	Tap, speed (rpm)	
	3. FLAP	Swing, fixed	
	4. Speed	Fan speed (rpm)	
	5. EV	Degree that electronic expansion valve is open (pls)	
	6. MP	Drain pump ON/OFF	
	7. 52H	Electric heater ON/OFF	
	8. Hu	Humidifier ON/OFF	
	9. Anti-freezing	Anti-freezing control ON/OFF	
3. Indoor Status Display 2/2	1. Unit No.	Select the Unit No. you want to check.	
		SkyAir	VRV
	2. Th1	Suction air thermistor	Suction air thermistor
	3. Th2	Heat exchanger thermistor	Heat exchanger liquid pipe thermistor
	4. Th3	—	Heat exchanger gas pipe thermistor
	5. Th4	Discharge air thermistor	Discharge air thermistor
	6. Th5	—	—
	7. Th6	—	—
4. Outdoor Status Display	1. Unit No.	Select the Unit No. you want to check.	
	2. FAN Tap 1	Fan tap	
	3. COMP	Compressor power supply frequency (Hz)	
	4. EV1	Degree that electronic expansion valve is open (pls)	
	5. SV1	Solenoid valve ON/OFF	
		SkyAir	VRV
	6. Th1	Outdoor air thermistor	—
	7. Th2	Heat exchanger thermistor	—
	8. Th3	Discharge pipe thermistor	—
5. Forced Defrost (SkyAir only)	1. Forced defrost ON	Enables the forced defrost operation.	
	2. Forced defrost OFF	Disables the forced defrost operation.	

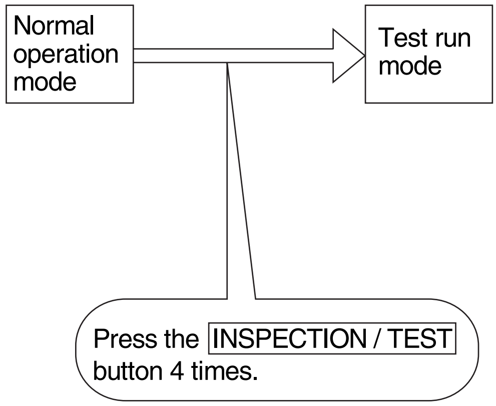
Service Menu	Item 2	Remarks
6. Error Display Selection	1. Warning display ON	Displays a warning on the screen if an error occurs.
	2. Warning display OFF	No warning is displayed.
	3. Error display ON	Displays the error on the screen.
	4. Error display OFF	Displays neither errors nor warnings.
7. Unit No. Transfer	1. Current Unit No.	A unit No. can be transferred to another.
	2. Transfer Unit No.	
8. Sensor Address Display	○ Unit No.: 0 - 15	Select the Unit No. you want to check.
	○ Code 00: 01: 02: 03: 04: 05: 06: 07: 08: 09:	 Remote controller thermistor (°C) Suction air thermistor (°C) Heat exchanger liquid pipe thermistor (°C) Heat exchanger gas thermistor (°C) Indoor unit address No. Outdoor unit address No. BS unit address No. Zone control address No. Cooling/Heating batch address No. Demand/low-noise address No.
	○ Data	The corresponding data will be displayed, based on the Unit No. and Code selected.

2.4 Test Run Mode

Operating the INSPECTION/TEST button on the remote controller will make it possible to put the system into test run mode.

(1) Test run mode setting

The test run mode setting can be made by conducting the following operation.

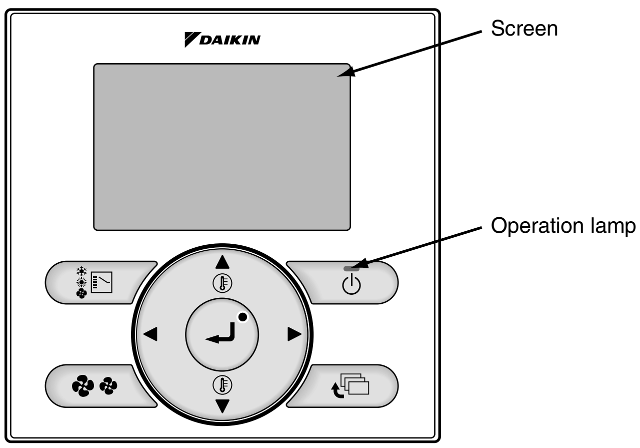


Press the ON/OFF button after the completion of test run mode setting, and a test run starts. (The remote controller will display "TEST RUN" on it.)

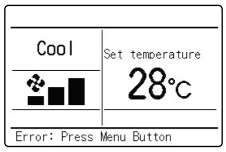
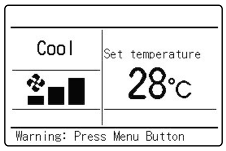
2.5 Remote Controller Self-Diagnosis Function

The following will be displayed on the screen when a malfunction (or a warning) occurs during operation.

Check the malfunction code and take the corrective action specified for the particular model.



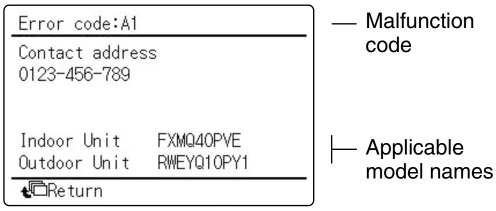
(1) Checking a malfunction or warning

	Operation Status	Display	
Abnormal shutdown	The system stops operating.	The operation lamp (green) starts to blink. The message "Malfunction: Press Menu button" will appear and blink at the bottom of the screen.	
Warning	The system continues its operation.	The operation lamp (green) remains on. The message "Warning: Press Menu button" will appear and blink at the bottom of the screen.	

(2) Taking corrective action

· Press the Menu/Enter button to check the malfunction code.

· Take the corrective action specific to the model.



○: ON ●: OFF ◑: Blink

	Malfunction code	Operation lamp	Malfunction contents	Page Referred
Outdoor Unit	E1	◑	PCB defect	110
	E2	◑	Actuation of high pressure switch (S1PH) or pressure switch (S2P)	111
	E3	◑	Actuation of high pressure switch (S1PH) or pressure switch (S2P)	112
	E4	◑	Actuation of low pressure sensor	114
	E5	◑	Inverter compressor motor lock	116
	E7	◑	Malfunction of outdoor unit fan motor	118
	E9	◑	Malfunction of moving part of electronic expansion valve (Y1E ~ Y5E)	121
	F3	◑	Abnormal discharge pipe temperature	123
	F4	◑	Humidity alarm	125
	F9	◑	Malfunction of BS unit electronic expansion valve	127
	H7	◑	Abnormal outdoor fan motor signal	129
	H9	◑	Malfunction of thermistor (R1T) for outdoor air	131
	J3	◑	Malfunction of discharge pipe thermistor (R31T, R32T, R33T)	132
	J4	◑	Malfunction of temperature sensor for heat exchanger gas (R2T or R11T)	132
	J5	◑	Malfunction of thermistor (R8T or R10T) for suction pipe	132
	J6	◑	Malfunction of thermistor (R4T or R12T) for outdoor unit heat exchanger	132
	J7	◑	Malfunction of liquid pipe thermistor 1 (R6T, R9T or R14T)	132
	J8	◑	Malfunction of liquid pipe thermistor 2 (R7T or R15T)	132
	J9	◑	Malfunction of subcooling heat exchanger gas pipe thermistor (R5T or R13T)	132
	JA	◑	Malfunction of high pressure sensor	134
	JC	◑	Malfunction of low pressure sensor	136
	L1	◑	Malfunction of inverter PCB	138
	L4	◑	Malfunction of inverter radiating fin temperature rise	140
	L5	◑	Momentary overcurrent of inverter compressor	142
	L8	◑	Momentary overcurrent of inverter compressor	144
	L9	◑	Inverter compressor starting failure	146
Outdoor Unit	LA	◑	Malfunction of power unit	—
	LC	◑	Malfunction of transmission between inverter and control PCB	149
	P1	◑	Inverter over-ripple protection	151
	P4	◑	Malfunction of inverter radiating fin temperature rise sensor	153
	PJ	◑	Faulty field setting after replacing main PCB or faulty combination of PCB	154
System	U1	◑	Reverse phase, open phase	156
	U2	◑	Power supply insufficient or instantaneous failure	157
	U3	◑	Check operation not executed	160
	U3	○	Check operation is not completed.	160
	U4	◑	Malfunction of transmission between indoor units and outdoor units	162
	U7	◑	Transmission failure (Across outdoor units)	165
	U8	◑	Malfunction of transmission between main and sub remote controllers	172
	U9	◑	Malfunction of transmission between indoor and outdoor units in the same system	173
	UA	◑	Improper combination of indoor and outdoor units, indoor units and remote controller	174
	UC	○	Address duplication of centralized controller	182
	UE	◑	Malfunction of transmission between centralized controller and indoor unit	183
	UF	◑	System is not set yet	186
	UH	◑	Malfunction of system, refrigerant system address undefined	187
Centralized Remote Controller and Schedule Timer	M1	○ or ●	PCB defect	—
	M8	○ or ●	Malfunction of transmission between optional controllers for centralized control	—
	MA	○ or ●	Improper combination of optional controllers for centralized control	—
	MC	○ or ●	Address duplication, improper setting	—

○: ON ●: OFF ◑: Blink

	Malfunction code	Operation lamp	Malfunction contents	Page Referred
Heat Reclaim Ventilation	64	○	Indoor unit's air thermistor error	—
	65	○	Outside air thermistor error	—
	6A	○	Damper system alarm	—
	6A	◑	Damper system + thermistor error	—
	6F	○	Malfunction of simple remote controller	—
	6H	○	Malfunction of door switch or connector	—
	94	◑	Internal transmission error	—

The system operates for malfunction codes indicated in black squares, however, be sure to check and repair.

Malfunction code indication by outdoor unit PCB

<Monitor mode>

To enter the monitor mode, push the MODE (BS1) button when in “Setting mode 1”.

* Refer to Page 78 for Monitor mode.

<Selection of setting item>

Push the SET (BS2) button and set the LED display to a setting item.

* Refer to Page 78 for Monitor mode.

<Confirmation of malfunction 1>

Push the RETURN (BS3) button once to display "First digit" of malfunction code.

<Confirmation of malfunction 2>

Push the SET (BS2) button once to display "Second digit" of malfunction code.

<Confirmation of malfunction 3>

Push the SET (BS2) button once to display "malfunction location".

Detail description on next page.

<Confirmation of malfunction 4>

Push the SET (BS2) button once to display "master or slave 1 or slave 2 or slave 3" and "malfunction location".

Push the RETURN (BS3) button and switches to the initial status of “Monitor mode”.

* Push the MODE (BS1) button and returns to “Setting mode 1”.

Malfunctions		Malfunction code
Description of malfunction	Description of malfunction (PGF)	Remote controller
PCB malfunction	PCB malfunction	E1
	Faulty PCB	
Abnormal discharge pressure or field piping pressure	HPS or PS activated	E2
Abnormal discharge pressure or field piping pressure	HPS or PS activated	E3
Abnormal suction pressure	Pe malfunction	E4
Compressor lock	INV compressor lock detected	E5
Overload, overcurrent and abnormal lock of outdoor unit fan motor	Instantaneous overcurrent of 1DC fan motor	E7
	1DC fan motor lock detected	
	Fan 1 IPM faulty protection detected	
Electronic expansion valve malfunction	EVM (main)	E9
	EVJ (refrigerant charging)	
	EVT (subcool heat exchanger)	
Abnormal discharge pipe temperature	Td malfunction	F3
Abnormal humidity	Humidity alarm	F4
BS unit electronic expansion valve malfunction	BS EVH disconnected (Y4E)	F9
	BS EVL disconnected (Y5E)	
	BS EVHS disconnected (Y2E)	
	BS EVLS disconnected (Y3E)	
	BS EVSC disconnected (Y1E)	
Positioning signal malfunction of outdoor unit fan motor	1DC fan motor positioning signal malfunction	H7
Abnormal outdoor temperature	Ta sensor malfunction (short-circuited or open)	H9
Discharge pipe temperature sensor malfunction	Sensor malfunction (open)	J3
	Sensor malfunction (short-circuited)	
Heat exchanger gas temperature sensor malfunction	Tg sensor malfunction (R4T)	J4
Suction pipe temperature sensor malfunction	TsA sensor malfunction (short-circuited) (R5T)	J5
Heat exchanger temperature sensor malfunction	Tb sensor malfunction (R6T)	J6
Liquid pipe temperature sensor malfunction	Tsc sensor malfunction (R8T)	J7
	TL sensor malfunction (R9T)	
Heat exchanger liquid pipe temperature sensor malfunction	Tf sensor malfunction (R3T)	J8
Subcool heat exchanger temperature sensor malfunction	Tsh sensor malfunction (R7T)	J9
Discharge pressure sensor malfunction	Pc sensor malfunction (open)	JA
	Pc sensor malfunction (short-circuited)	
Suction pressure sensor malfunction	Pc sensor malfunction (open)	JC
	Pe sensor malfunction (short-circuited)	
INV PCB malfunction	Faulty IPM	L1
	Current sensor failure confirmation 1	
	Current sensor failure confirmation 2	
	IGBT malfunction	
Rise in INV radiation fin temperature	Overheat of INV radiation fin temperature	L4
DC output overcurrent	Instantaneous overcurrent of INV	L5
Electronic thermal	Electronic thermal 1	L8
	Electronic thermal 2	
	Loss of synchronization	
	Thunder detected	
Stall prevention (time limit)	Stall prevention (increased current)	L9
	Stall prevention (startup failure)	
	Loss of synchronization	
INV transmission malfunction	INV transmission data malfunction	LC
	INV transmission malfunction	

○ : ON
◑ : Blink
● : OFF

○: ON ●: OFF ◑:Blink

Malfunction code	Confirmation of malfunction 1 (Check 1)							Confirmation of malfunction 2 (Check 2)							Confirmation of malfunction 3 (Check 3)							Confirmation of malfunction 4 (Check 4)						
	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H1P	H2P	H3P	H4P	H5P	H6P	H7P
E1	◑	◑	●	●	●	◑	◑	◑	●	○	●	●	●	◑	◑	○	●	●	●	●	●	◑	○	○	●	◑	◑	◑
								◑	●	○	●	●	●	◑	◑	○	●	●	●	●	●	◑	○	○	◑	◑	◑	◑
E2								◑	●	○	●	●	◑	●	◑	○	●	●	●	●	●	◑	○	○	●	*1		
E3								◑	●	○	●	●	◑	◑	◑	○	●	●	●	●	●	◑	○	○	●			
E4								◑	●	○	●	◑	●	●	◑	○	●	●	●	●	●	◑	○	○	●			
E5								◑	●	○	●	◑	●	◑	◑	○	●	●	●	●	●	◑	○	○	●			
E7								◑	●	○	●	◑	◑	◑	◑	○	●	●	●	●	●	◑	○	○	●			
															◑	○	●	●	●	●	●	◑	○	○	◑			
															◑	○	●	●	●	●	◑	◑	○	○	●			
E9								◑	●	○	◑	●	●	◑	◑	○	●	●	●	●	●	◑	○	○	●			
															◑	○	●	●	●	●	●	◑	○	○	◑			
															◑	○	●	●	●	●	◑	◑	○	○	●			
F3	◑	◑	●	●	◑	●	◑	◑	●	○	●	●	◑	◑	◑	○	●	●	●	●	●	◑	○	○	●	*1		
F4								◑	●	○	●	◑	●	●	◑	○	●	●	●	●	●	◑	○	○	●	◑	◑	◑
F9								◑	●	○	◑	●	●	◑	◑	○	●	●	●	●	●	◑	○	○	●	◑	◑	◑
															◑	○	●	●	●	●	●	◑	○	○	◑	◑	◑	◑
															◑	○	●	●	●	●	◑	◑	○	○	●	◑	◑	◑
															◑	○	●	●	●	●	◑	◑	○	○	◑	◑	◑	◑
															◑	○	●	●	●	◑	●	◑	○	○	●	◑	◑	◑
H7	◑	◑	●	●	◑	●	●	◑	●	○	●	◑	◑	◑	◑	○	●	●	●	●	●	◑	○	○	●	*1		
H9								◑	●	○	◑	●	●	◑	◑	○	●	●	●	●	●	◑	○	○	●			
J3	◑	◑	●	●	◑	◑	●	◑	●	○	●	●	◑	◑	◑	○	●	●	●	●	●	◑	○	○	●	*1		
															◑	○	●	●	●	●	◑	◑	○	○	◑			
J4								◑	●	○	●	◑	●	●	◑	○	●	●	●	●	●	◑	○	○	●			
J5								◑	●	○	●	◑	●	◑	◑	○	●	●	●	●	●	◑	○	○	●			
J6								◑	●	○	●	◑	◑	●	◑	○	●	●	●	●	●	◑	○	○	●			
J7								◑	●	○	●	◑	◑	◑	◑	○	●	●	●	●	●	◑	○	○	●			
																						◑	○	○	●			
J8								◑	●	○	◑	●	●	●	◑	○	●	●	●	●	●	◑	○	○	●			
J9								◑	●	○	◑	●	●	◑	◑	○	●	●	●	●	●	◑	○	○	●			
JA								◑	●	○	◑	●	◑	●	◑	○	●	●	●	●	●	◑	○	○	●			
															◑	○	●	●	●	●	●	◑	○	○	◑			
JC								◑	●	○	◑	◑	●	●	◑	○	●	●	●	●	●	◑	○	○	●			
															◑	○	●	●	●	●	●	◑	○	○	◑			
L1	◑	◑	●	●	◑	◑	◑	◑	●	○	●	●	●	◑	◑	○	●	●	●	●	●	◑	○	○	●	*1		
															◑	○	●	●	●	●	●	◑	○	○	◑			
															◑	○	●	●	●	●	◑	◑	○	○	●			
															◑	○	●	●	●	●	◑	◑	○	○	◑			
L4								◑	●	○	●	◑	●	●	◑	○	●	●	●	●	●	◑	○	○	●			
L5								◑	●	○	●	◑	●	◑	◑	○	●	●	●	●	●	◑	○	○	●			
L8								◑	●	○	◑	●	●	●	◑	○	●	●	●	●	●	◑	○	○	●			
															◑	○	●	●	●	●	●	◑	○	○	●			
															◑	○	●	●	●	●	●	◑	○	○	●			
															◑	○	●	●	●	●	●	◑	○	○	●			
L9								◑	●	○	◑	●	●	◑	◑	○	●	●	●	●	●	◑	○	○	●			
															◑	○	●	●	●	●	●	◑	○	○	●			
															◑	○	●	●	●	●	●	◑	○	○	●			
LC								◑	●	○	◑	◑	●	●	◑	○	●	●	●	●	●	◑	○	○	◑			
															◑	○	●	●	●	●	◑	◑	○	○	●			

Check 1 H4P–H7P: Display of contents of malfunction (first digit)
Check 2 H4P–H7P: Display of contents of malfunction (second digit)
Check 3 H1P–H7P: Display 1 of malfunction in detail
Check 4 H4P–H7P: Display 2 of malfunction in detail

*1: Faulty system				Individual system	Multi system
●	●	●	→	Right-hand system	Master
●	●	◑	→	Left-hand system	Slave 1
●	◑	●	→	—	Slave 2
●	◑	◑	→	—	Slave 3
◑	◑	◑	→	All systems	System

<Monitor mode>

To enter the monitor mode, push the MODE (BS1) button when in “Setting mode 1”.

* Refer to Page 78 for Monitor mode.

<Selection of setting item>

Push the SET (BS2) button and set the LED display to a setting item.

* Refer to Page 78 for Monitor mode.

<Confirmation of malfunction 1>

Push the RETURN (BS3) button once to display "First digit" of malfunction code.

<Confirmation of malfunction 2>

Push the SET (BS2) button once to display "Second digit" of malfunction code.

<Confirmation of malfunction 3>

Push the SET (BS2) button once to display "malfunction location".

Detail description on next page.

<Confirmation of malfunction 4>

Push the SET (BS2) button once to display "master or slave 1 or slave 2 or slave 3" and "malfunction location".

Push the RETURN (BS3) button and switches to the initial status of “Monitor mode”.

* Push the MODE (BS1) button and returns to “Setting mode 1”.

Malfunctions		Malfunction code
Description of malfunction	Description of malfunction (PGF)	Remote controller
Open phase and unbalanced power supply	Unbalanced INV power supply voltage	P1
INV radiation fin temperature sensor malfunction	INV fin thermistor malfunction	P4
Faulty combination of INV and fan driver	Faulty combination of INV	PJ
Reversed phase	Reversed phase malfunction	U1
	Reversed phase malfunction (ON)	
Abnormal power supply voltage	Insufficient INV voltage	U2
	INV open phase (single phase)	
	Abnormal charge of capacitor of INV main circuit	
Test run not carried out yet	Test run not carried out yet	U3
	Test run was not completed normally	
	Test run was not completed (during initial transmission)	
	Test run was not completed (during normal transmission)	
	Test run was not completed (transmission error)	
	Test run was not completed (all units have transmission error)	
Faulty transmission between indoor and outdoor units	IN-OUT transmission malfunction	U4
	System malfunction	
Faulty transmission between outdoor units	Malfunction caused when mounting the external control adaptor	U7
	Alarm given when mounting the external control adaptor	
	Malfunction caused between the master and the slave 1	
	Malfunction caused between the master and the slave 2	
	Malfunction caused between the master and the slave 3	
	Faulty address setting of slaves 1, 2 and 3	
	4 or more outdoor units connected in the same system	
	Erroneous address of slaves 1, 2 and 3	
	BS alarm	
	Indoor connection capacity malfunction by a test run	
Faulty transmission with other systems	Other system or other unit in the same system	U9
Faulty field setting	Excess indoor units connected	UA
	Connection of erroneous models of indoor unit	
	Faulty combination of outdoor units	
	BS unit malfunction	
	Faulty wiring in units dedicated to multi connections	
	Faulty connection of former BS unit	
	Faulty connection between outdoor and BS unit	
	Faulty connection between BS units	
	Wrong number of indoor units connected to BS unit	
	Faulty connection of BS unit at HP	
	Faulty connection of outdoor unit at HP/HR	
	Faulty combination of outdoor multi	
Unmatched wiring/piping, no system settings	Unmatched wiring/piping	UF
Faulty system line	Wrong wiring (auto address error)	UH

○ : ON
◑ : Blink
● : OFF

○: ON ●: OFF ◑:Blink

Malfunction code	Confirmation of malfunction 1 (Check 1)							Confirmation of malfunction 2 (Check 2)							Confirmation of malfunction 3 (Check 3)							Confirmation of malfunction 4 (Check 4)						
	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H1P	H2P	H3P	H4P	H5P	H6P	H7P
P1	◑	◑	●	◑	●	●	●	◑	●	○	●	●	●	◑	◑	○	●	●	●	●	●	◑	○	○	●	*1		
P4								◑	●	○	●	◑	●	●	◑	○	●	●	●	●	●	◑	○	○	●			
PJ								◑	●	○	◑	◑	●	◑	◑	○	●	●	●	●	●	◑	○	○	●			
U1	◑	◑	●	◑	●	●	●	◑	●	○	●	●	●	◑	◑	○	●	●	●	●	●	◑	○	○	●	◑	◑	◑
															◑	○	●	●	●	●	●	◑	○	○	◑	◑	◑	◑
U2								◑	●	○	●	●	◑	●	◑	○	●	●	●	●	●	◑	○	○	●	◑	◑	◑
															◑	○	●	●	●	●	●	◑	○	○	◑	◑	◑	◑
															◑	○	●	●	●	●	◑	◑	○	○	●	◑	◑	◑
U3								◑	●	○	●	●	◑	◑	◑	○	●	●	●	●	●	◑	○	○	●	◑	◑	◑
															◑	○	●	●	●	●	◑	◑	○	○	●	◑	◑	◑
															◑	○	●	●	●	●	◑	◑	○	○	◑	◑	◑	◑
															◑	○	●	●	●	◑	●	◑	○	○	●	◑	◑	◑
															◑	○	●	●	●	◑	●	◑	○	○	◑	◑	◑	◑
															◑	○	●	●	●	◑	◑	◑	○	○	●	◑	◑	◑
U4								◑	●	○	●	◑	●	●	◑	○	●	●	●	●	●	◑	○	○	●	◑	◑	◑
															◑	○	●	●	●	●	●	◑	○	○	◑	◑	◑	◑
U7								◑	●	○	●	◑	◑	◑	◑	○	●	●	●	●	●	◑	○	○	◑	◑	◑	◑
															◑	○	●	●	●	●	●	◑	○	○	●	◑	◑	◑
															◑	○	●	●	●	●	◑	◑	○	○	●	◑	◑	◑
															◑	○	●	●	●	●	◑	◑	○	○	◑	◑	◑	◑
															◑	○	●	●	●	◑	●	◑	○	○	●	◑	◑	◑
															◑	○	●	●	●	◑	◑	◑	○	○	◑	◑	◑	◑
															◑	○	●	●	◑	●	●	◑	○	○	●	◑	◑	◑
															◑	○	●	●	◑	●	●	◑	○	○	◑	◑	◑	◑
															◑	○	●	●	◑	●	◑	◑	○	○	●	◑	◑	◑
															◑	○	●	●	◑	●	◑	◑	○	○	◑	◑	◑	◑
U9								◑	●	○	◑	●	●	◑	◑	○	●	●	●	●	●	◑	○	○	●	◑	◑	◑
UA								◑	●	○	◑	●	◑	●	◑	○	●	●	●	●	◑	◑	○	○	●	◑	◑	◑
															◑	○	●	●	●	◑	●	◑	○	○	●	◑	◑	◑
															◑	○	●	●	●	◑	●	◑	○	○	◑	◑	◑	◑
															◑	○	●	●	◑	●	●	◑	○	○	●	◑	◑	◑
															◑	○	●	●	◑	●	●	◑	○	○	◑	◑	◑	◑
															◑	○	●	●	◑	●	◑	◑	○	○	◑	◑	◑	◑
															◑	○	●	●	◑	◑	●	◑	○	○	●	◑	◑	◑
															◑	○	●	●	◑	◑	●	◑	○	○	◑	◑	◑	◑
															◑	○	●	●	◑	◑	◑	◑	○	○	●	◑	◑	◑
															◑	○	●	●	◑	◑	◑	◑	○	○	◑	◑	◑	◑
															◑	○	●	◑	●	●	●	◑	○	○	●	◑	◑	◑
															◑	○	●	◑	●	●	●	◑	○	○	◑	◑	◑	◑
UF								◑	●	○	◑	◑	◑	◑	◑	○	●	●	●	●	●	◑	○	○	●	◑	◑	◑
UH								◑	●	○	◑	●	◑	◑	◑	○	●	●	●	●	●	◑	○	○	●	◑	◑	◑

Check 1 H4P–H7P: Display of contents of malfunction (first digit)
Check 2 H4P–H7P: Display of contents of malfunction (second digit)
Check 3 H4P–H7P: Display 1 of malfunction in detail
Check 4 H4P–H7P: Display 2 of malfunction in detail

*1: Faulty system

				Individual system	Multi system
●	●	●	→	Right-hand system	Master
●	●	◑	→	Left-hand system	Slave 1
●	◑	●	→	—	Slave 2
●	◑	◑	→	—	Slave 3
◑	◑	◑	→	All systems	System

2.6 “E1” Outdoor Unit: PCB Defect

Remote Controller Display

E1

Applicable Models

RQYQ-PY1
RQEQ-PY1

Method of Malfunction Detection

Abnormality is detected under the communication conditions in the hardware section between the indoor unit and outdoor unit.

Malfunction Decision Conditions

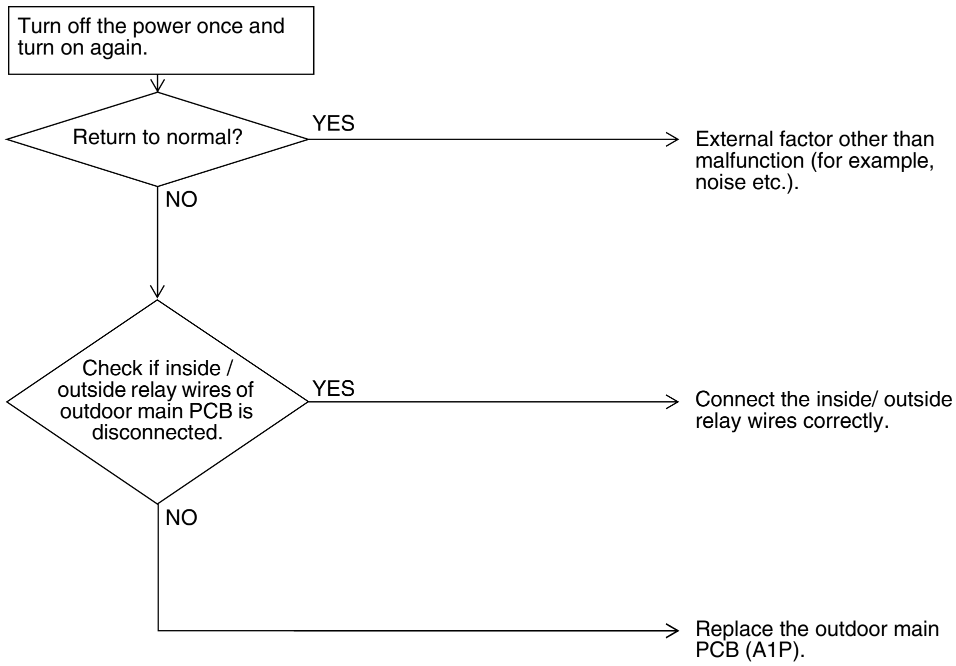
When the communication conditions in the hardware section between the indoor unit and the outdoor unit are not normal.

Supposed Causes

- Defect of outdoor unit PCB (A1P)
- Defective connection of inside/ outside relay wires

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



2.7 “E2” Outdoor Unit: Actuation of High Pressure Switch (S1PH) or Pressure Switch (S2P)

Remote Controller Display

E2

Applicable Models

RQYQ-PY1
RQEQ-PY1

Method of Malfunction Detection

Malfunction is detected by the relationship between "pressure detected by the high pressure sensor" and "operation of the high pressure switch (S1PH) or pressure switch (S2P)".

Malfunction Decision Conditions

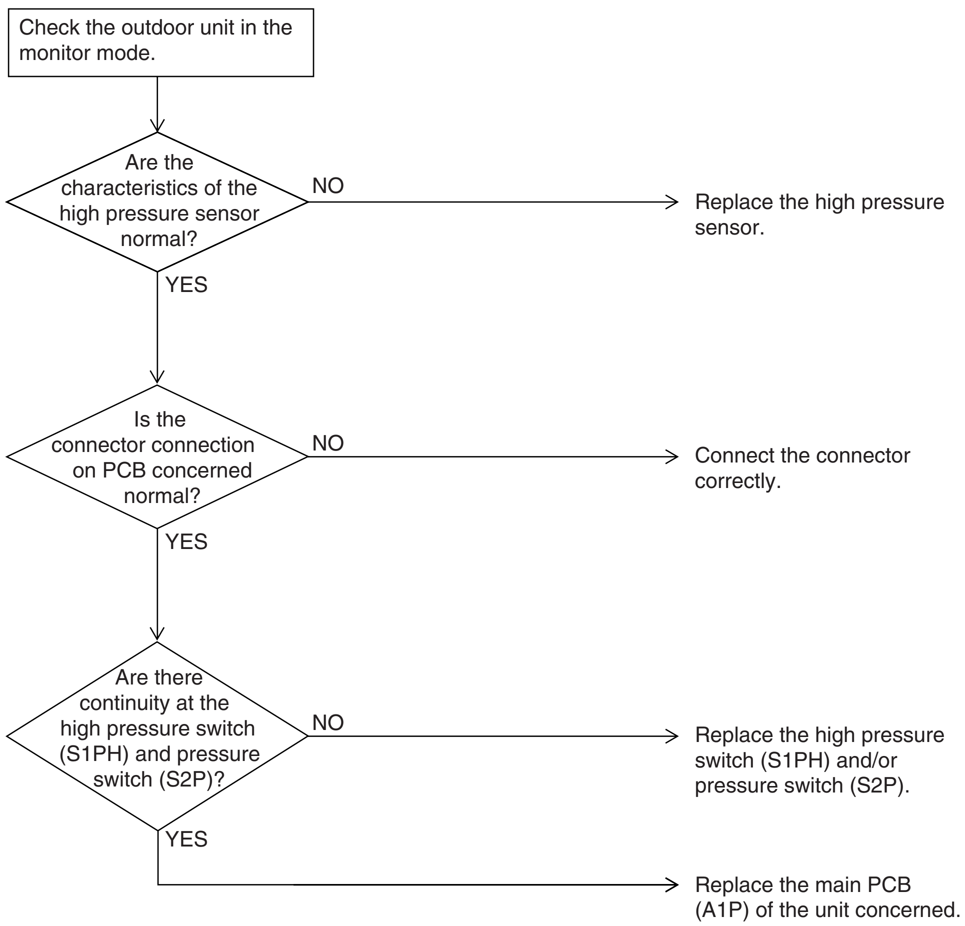
When the high pressure switch (S1PH) or pressure switch (S2P) operates under low pressure detected by the high pressure sensor during compressor operation.
Operating pressure of high pressure switch (S1PH): 4.0MPa
Operating pressure of pressure switch (S2P): 3.3MPa

Supposed Causes

- Defect of high pressure sensor
- Defect of connection of connector for high pressure switch (S1PH) or pressure switch (S2P)
- Defect of high pressure switch (S1PH) or pressure switch (S2P)

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



2.8 "E3" Outdoor Unit: Actuation of High Pressure Switch (S1PH) or Pressure Switch (S2P)

Remote Controller Display	E3
Applicable Models	RQYQ-PY1 RQEQ-PY1
Method of Malfunction Detection	Abnormality is detected by the protection device circuit that detects continuity at the high pressure switch (S1PH) and pressure switch (S2P).
Malfunction Decision Conditions	When the contact of the high pressure switch (S1PH) or pressure switch (S2P) opens. (Reference) Operating pressure of high pressure switch (S1PH) Operating pressure: 4.0MPa Reset pressure: 3.0MPa Operating pressure of pressure switch (S2P) Operating pressure: 3.3MPa Reset pressure: 2.5MPa
Supposed Causes	■ Actuation of outdoor unit high pressure switch (S1PH) or pressure switch (S2P) ■ Defect of high pressure switch (S1PH) or pressure switch (S2P) ■ Defect of outdoor unit main PCB (A1P) ■ Instantaneous power failure ■ Faulty high pressure sensor

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

Check for the points shown below.
(1) Are the high pressure switch (S1PH) and pressure switch (S2P) connector properly connected to the main PCB?
(2) Do the high pressure switch (S1PH) and pressure switch (S2P) have continuity?

Are the two points above OK?
- NO → Rectify defective points, if any.
- YES ↓

(1) Mount a pressure gauge on the high pressure service port and high and low pressure gas stop valve service port.
(2) Reset the operation using the remote controller, and then restart the operation.

Does the stop due to malfunction (E3) recur?
- NO ↓ (to next check)
- YES → **Is the pressure switch (S2P) operating value normal (i.e., 3.3MPa)?**
  - YES ↓ (to next check)
  - NO → **Is the high pressure switch (S1PH) operating value normal (i.e., 4.0MPa)?**
    - YES ↓ (to next check)
    - NO → Replace the high pressure switch (S1PH) and pressure switch (S2P).

Are the characteristics of the high pressure sensor normal? (See *1.)
- NO → Replace the high pressure sensor.
- YES ↓

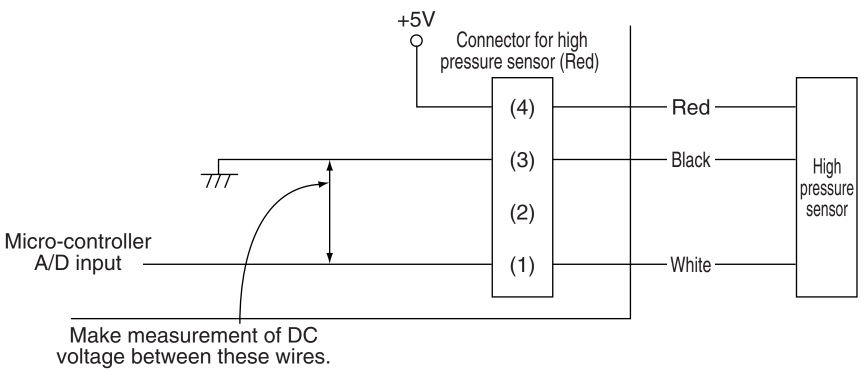
Service Checker
Connect the service checker to compare the "high pressure" value and the actual measurement value by pressure sensor (Refer to *1) by using the service checker.

Check if the "high pressure" value and the actual measurement value by pressure sensor are the same.
- NO → Replace the main PCB (A1P).
- YES ↓

· The high pressure sensor is normal, and the pressure detected with the PCB are also normal.
· The high pressure or field piping pressure has really become high.

CHECK 1 Referring to information on P.189, remove the causes by which the high pressure or field piping pressure has become high.

*1: Make a comparison between the voltage of the pressure sensor and that read by the pressure gauge.
(As to the voltage of the pressure sensor, make measurement of voltage at the connector, and then convert it to pressure according to information on P.201.)
*2: Make measurement of voltage of the pressure sensor.



2.9 "E4" Outdoor Unit: Actuation of Low Pressure Sensor

Remote Controller Display

E4

Applicable Models

RQYQ-PY1
RQEQ-PY1

Method of Malfunction Detection

Abnormality is detected by the pressure value of the low pressure sensor with the main PCB.

Malfunction Decision Conditions

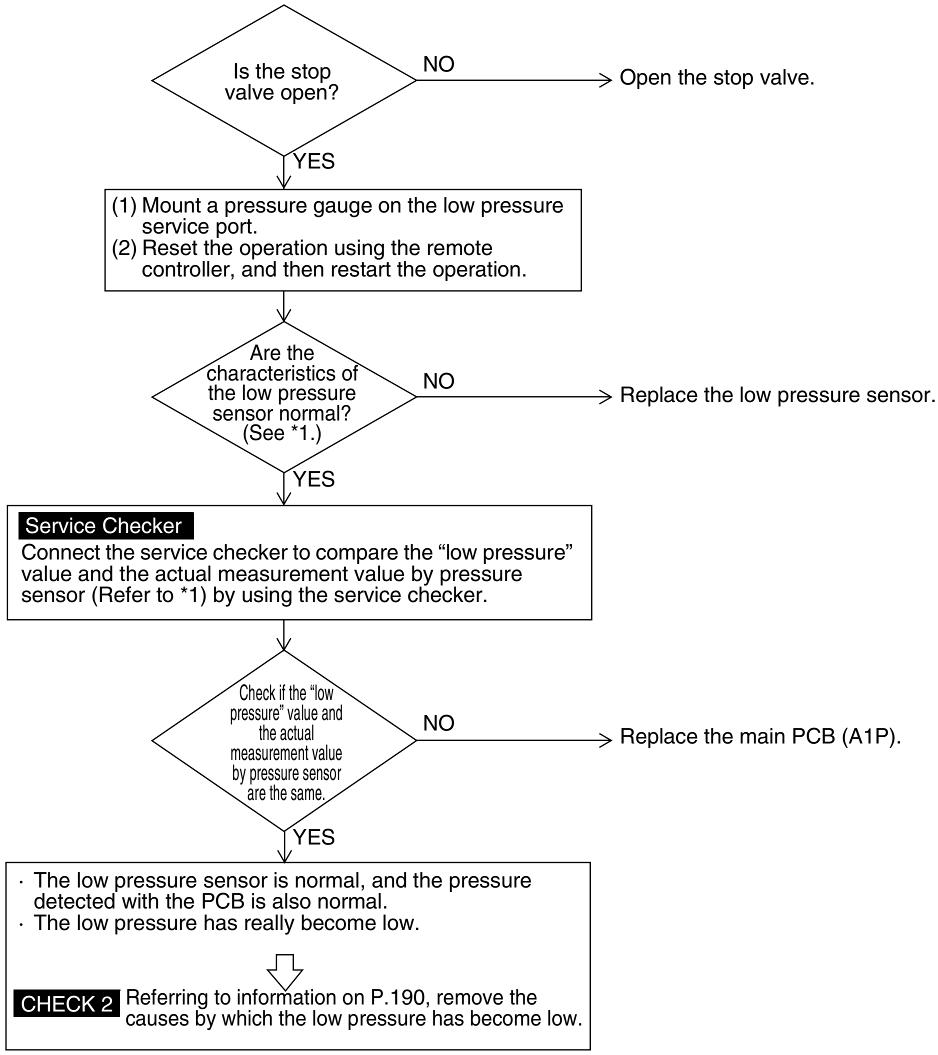
Error is generated when the low pressure is dropped under compressor operation.
Operating pressure:0.07MPa

Supposed Causes

- Abnormal drop of low pressure
- Defect of low pressure sensor
- Defect of outdoor unit PCB (A1P)
- Stop valve is left in closed

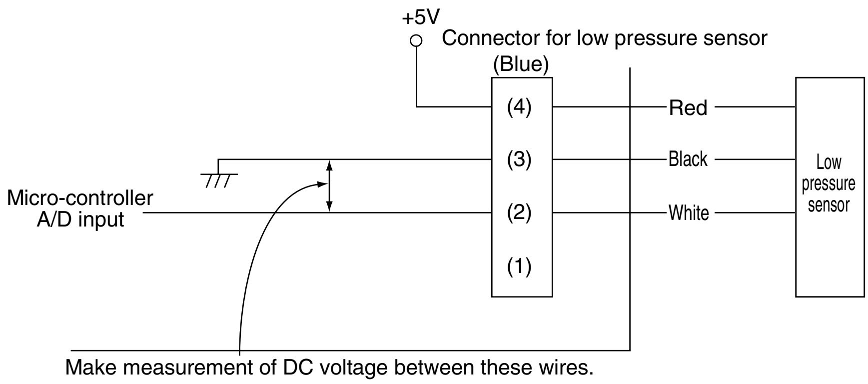
Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



*1: Make a comparison between the voltage of the pressure sensor and that read by the pressure gauge.
(As to the voltage of the pressure sensor, make measurement of voltage at the connector, and then convert it to pressure according to information on P.201.)

*2: Make measurement of voltage of the pressure sensor.

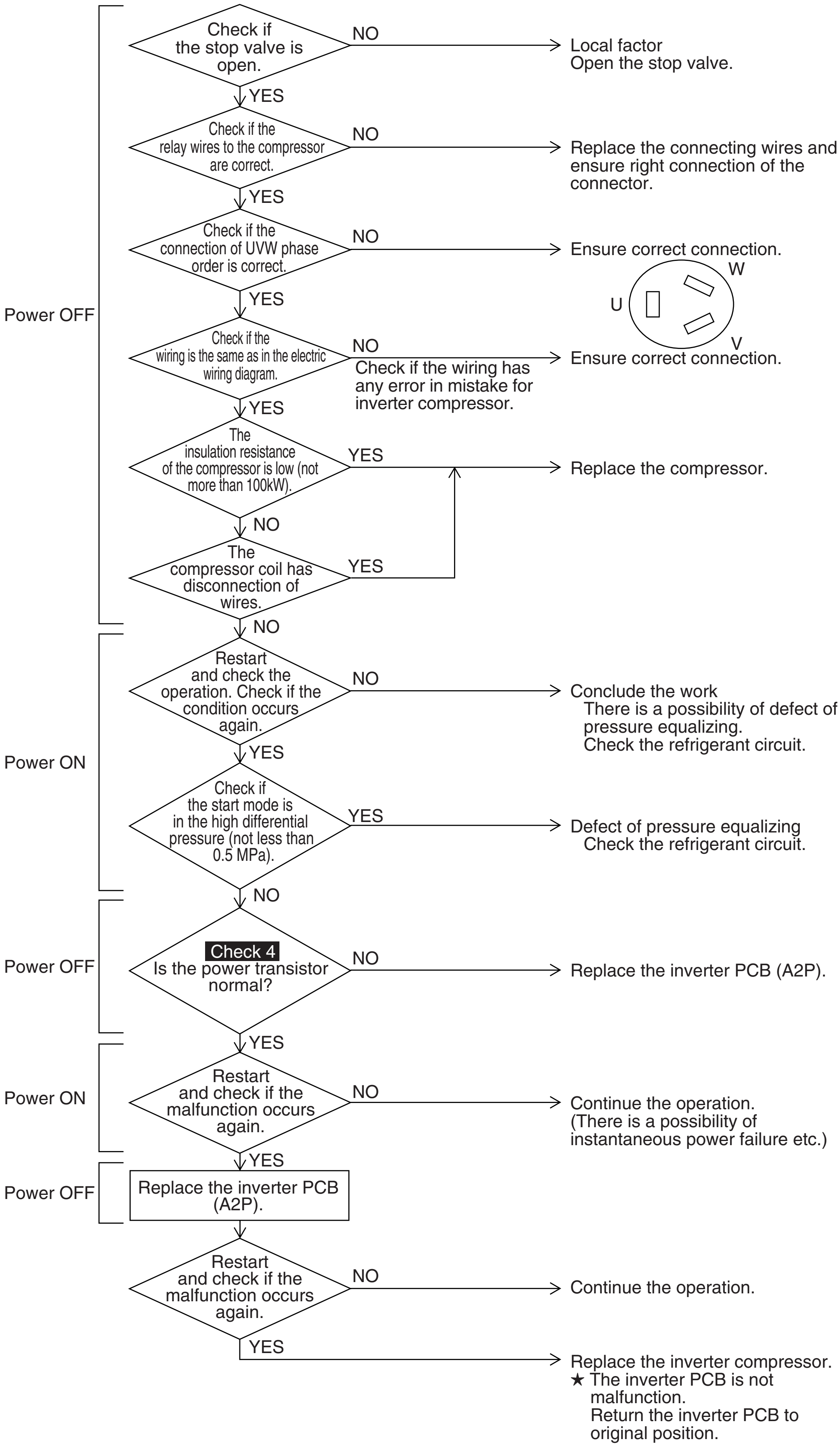


2.10 “E5” Outdoor Unit: Inverter Compressor Motor Lock

Remote Controller Display	E5
Applicable Models	RQYQ-PY1 RQEQ-PY1
Method of Malfunction Detection	Inverter PCB takes the position signal from UVW line connected between the inverter and compressor, and the malfunction is detected when any abnormality is observed in the phase-current waveform.
Malfunction Decision Conditions	This malfunction will be output when the inverter compressor motor does not start up even in forced startup mode.
Supposed Causes	■ Inverter compressor lock ■ High differential pressure (0.5MPa or more) ■ Incorrect UVW wiring ■ Faulty inverter PCB ■ Stop valve is left in closed

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



2.11 "E7" Outdoor Unit: Malfunction of Outdoor Unit Fan Motor

Remote Controller Display

E7

Applicable Models

RQYQ-PY1
RQEQ-PY1

Method of Malfunction Detection

① Detect a malfunction based on the current value in the INVERTER PCB (as for motor 2, current value in the fan PCB).
② Detect a malfunction for the fan motor circuit based on the number of rotation detected by hole IC during the fan motor operation.

Malfunction Decision Conditions

- Overcurrent is detected for INVERTER PCB (A2P) or fan INVERTER PCB (A5P)
  (System down is caused by 4 times of detection.)
- In the condition of fan motor rotation, the number of rotation is below the fixed number for more than 6 seconds. (System down is caused by 4 times of detection.)

Supposed Causes

- Failure of fan motor
- Defect or connection error of the connectors/ harness between the fan motor and PCB
- The fan can not rotate due to any foreign substances entangled.
- Clear condition: Continue normal operation for 5 minutes

Troubleshooting

⚠ **Caution** Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

Check in the monitor mode

Check electric motor (electric motor) corresponding to malfunction code "E7" in the monitor mode of outdoor unit PCB. (Refer to P.106~P.107 for how to check)

↓

Cut the power supply OFF and wait for 10 minutes.

↓

Check if any foreign substances around the fan. — YES → Remove the foreign substances.

NO ↓

Check the connection status of the connectors

○ Fan motor: relay connector or X1A, X2A of compressor inverter PCB.

↓

Check if any connector is disconnected. — YES → Insert the connector.

NO ↓

Check the color of relay connectors

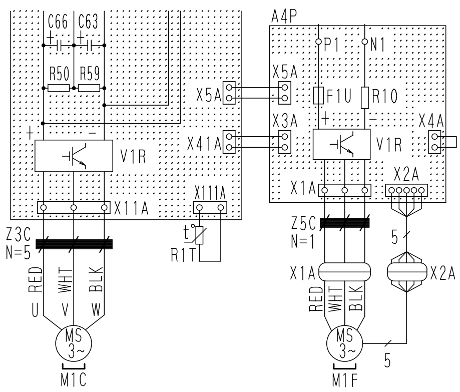
○ Fan motor: Both power supply wire and signal wire are all white.

↓

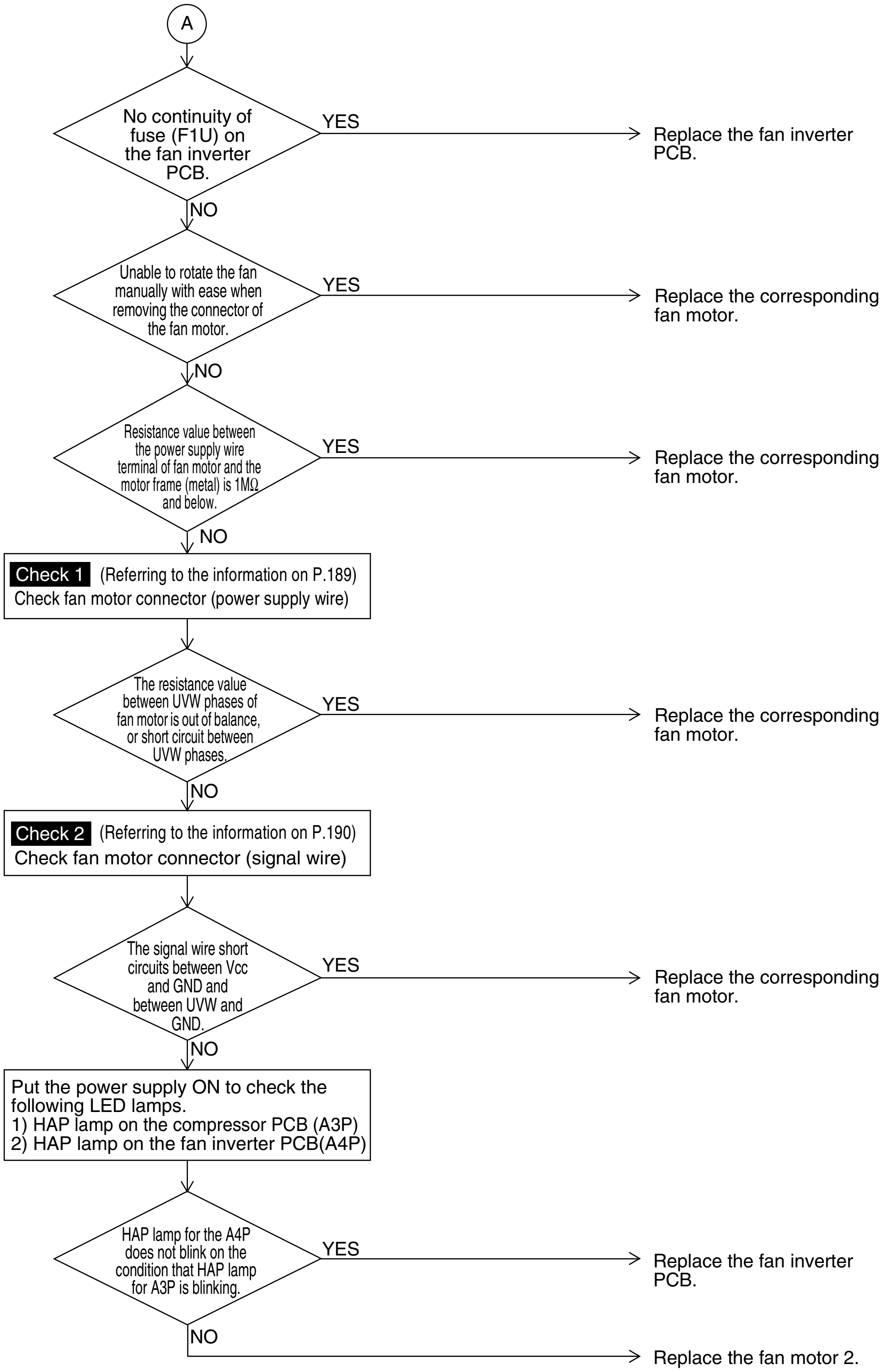
Relay connectors have any connection error. — YES → Correct the connection of the relay connectors.

NO ↓

(A)



Troubleshooting



2.12 “E9” Outdoor Unit: Malfunction of Electronic Expansion Valve Coil (Y1E~Y3E)

Remote Controller Display

E9

Applicable Models

RQYQ-PY1
RQEQ-PY1

Method of Malfunction Detection

Check the continuity of electronic expansion valve coil (Y1E)

Malfunction Decision Conditions

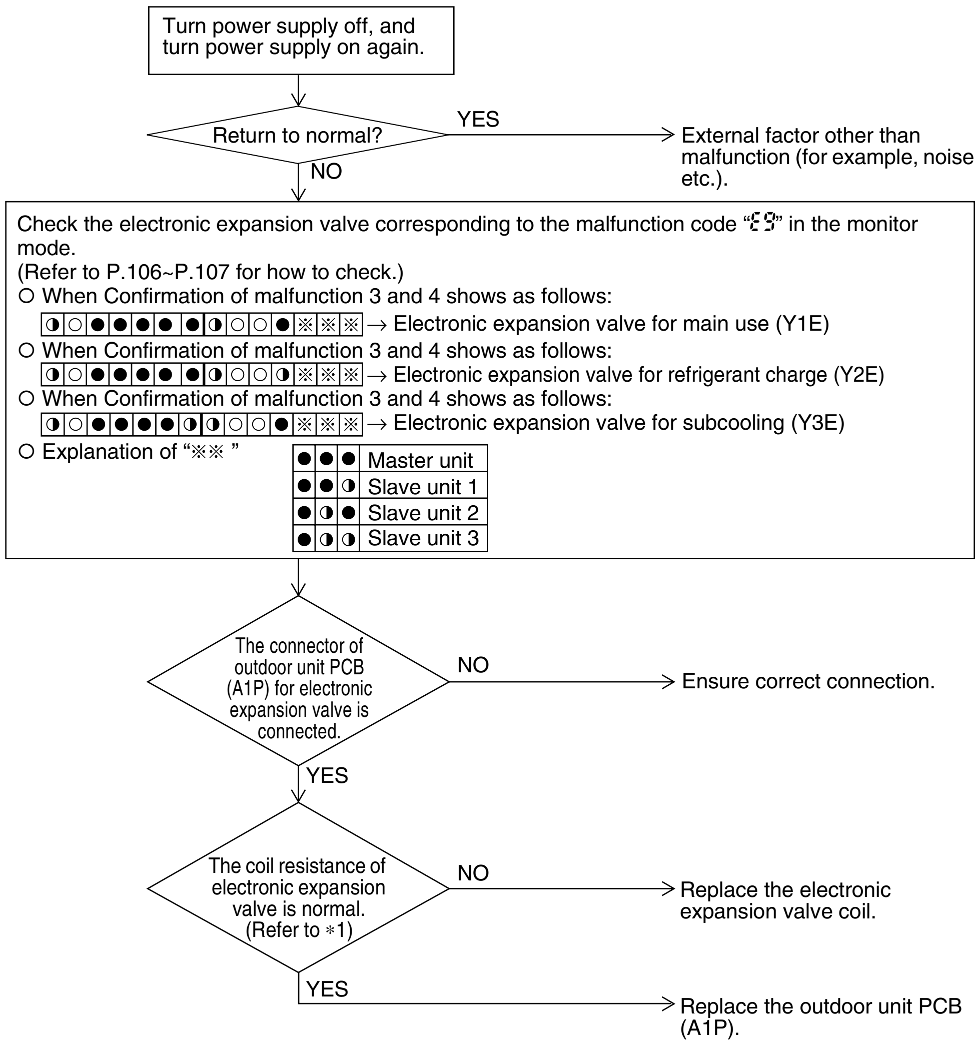
No current is detected in the common (COM [+]) when power supply is ON.

Supposed Causes

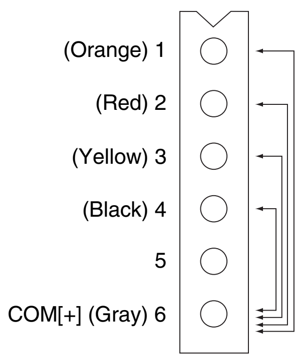
- Disconnection of connectors for electronic expansion valve (Y1E)
- Defect of electronic expansion valve coil
- Defect of outdoor unit main PCB (A1P)

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



∗ Make measurement of resistance between the connector pins, and then make sure the resistance falls in the range of 40 to 50Ω.



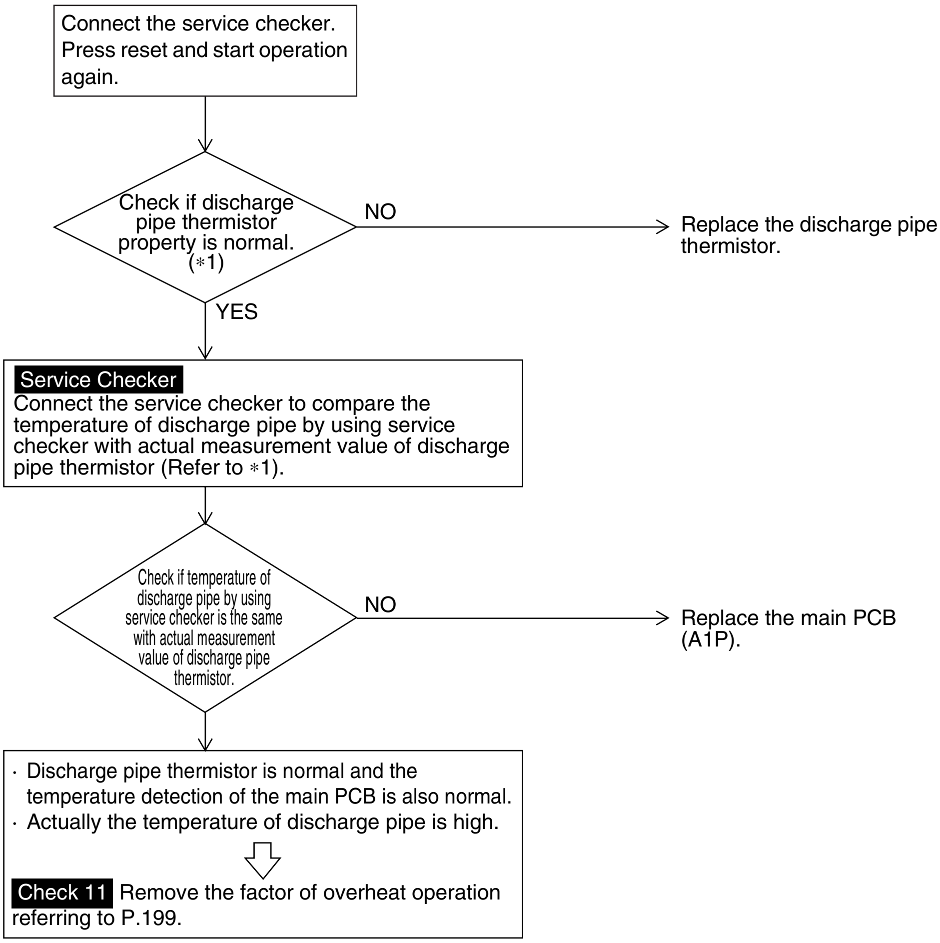
Measuring points	Judgement criteria
1 - 6	40~50Ω
2 - 6	
3 - 6	
4 - 6	

2.13 "F3" Outdoor Unit: Abnormal Discharge Pipe Temperature

Remote Controller Display	F3
Applicable Models	RQYQ-PY1 RQEQ-PY1
Method of Malfunction Detection	Abnormality is detected according to the temperature detected by the discharge pipe temperature sensor.
Malfunction Decision Conditions	When the discharge pipe temperature rises to an abnormally high level (135 °C and above) When the discharge pipe temperature rises suddenly (120 °C and above for 10 successive minutes)
Supposed Causes	■ Faulty discharge pipe temperature ■ Faulty connection of discharge pipe thermistor ■ Faulty outdoor unit PCB (A1P)

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



∗1: Compare the resistance value of discharge pipe thermistor and the value based on the surface thermometer.

∗ Refer to "Thermistor Resistance / Temperature Characteristics" table on P199.

2.14 "F4" Outdoor Unit: Humidity alarm

Remote Controller Display

F4

Applicable Models

RQYQ-PY1
RQEQ-PY1

Method of Malfunction Detection

The condition of the liquid refrigerant returning to the compressor is detected by the temperature and pressure of any part during the cooling operation.

Malfunction Decision Conditions

When the following humidity condition continues for 30 minutes

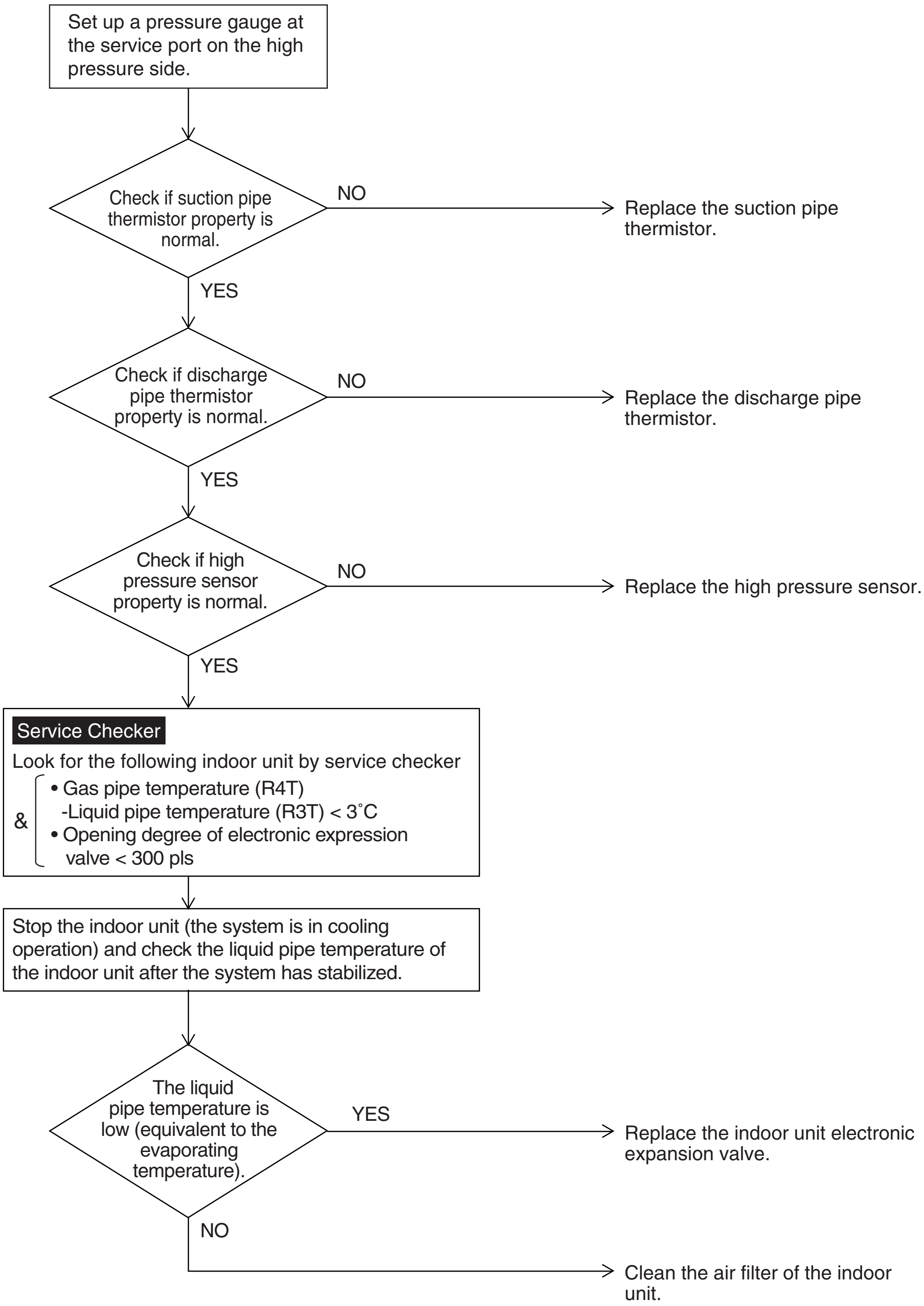
& [
- Humidity condition in the indoor unit
- Humidity condition in some indoor units

Supposed Causes

- Faulty suction pipe thermistor
- Faulty discharge pipe thermistor
- Defect of high pressure sensor
- Defect of indoor unit electronic expansion valve
- Contamination of the air filter

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

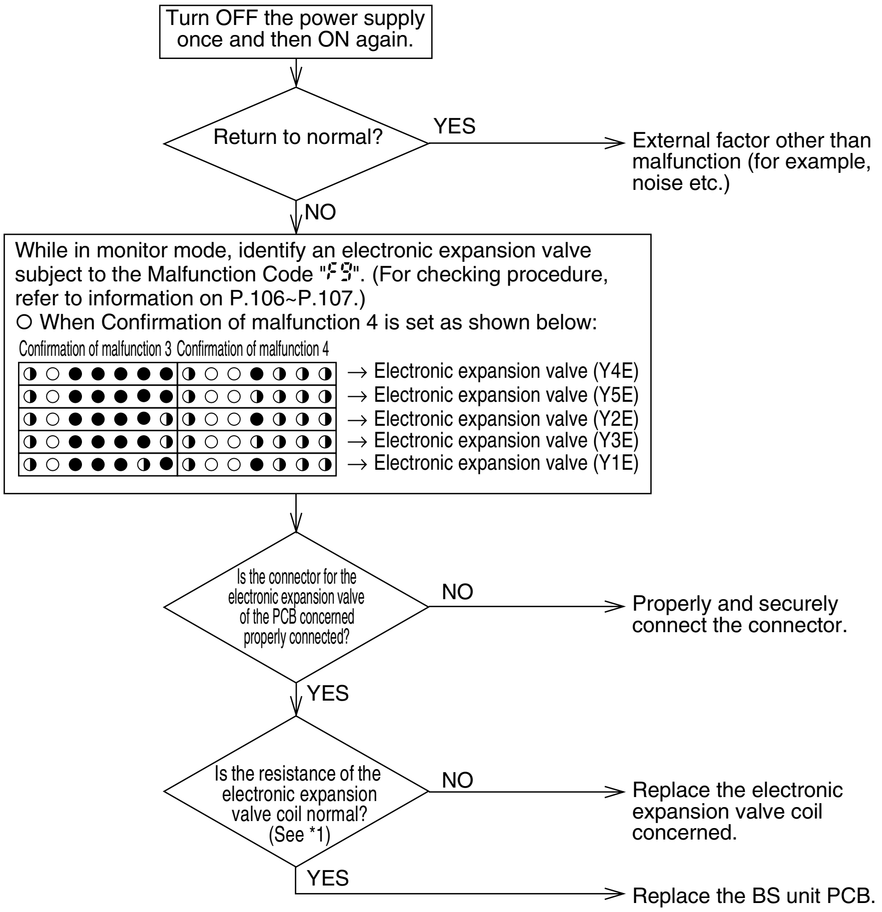


2.15 "F9" Outdoor Unit : Malfunction of BS Unit Electronic Expansion Valve

Remote Controller Display	F9
Applicable Models	BSVQ100-250P RQEQ-PY1
Method of Malfunction Detection	This malfunction is detected by whether or not all coils of the electronic expansion valve have continuity.
Malfunction Decision Conditions	When the power supply turns ON, there is no currents pass through the common (COM[+]).
Supposed Causes	■ Connector disconnected from the electronic expansion valve ■ Faulty of the electronic expansion valve coil ■ Faulty PCB of the BS unit

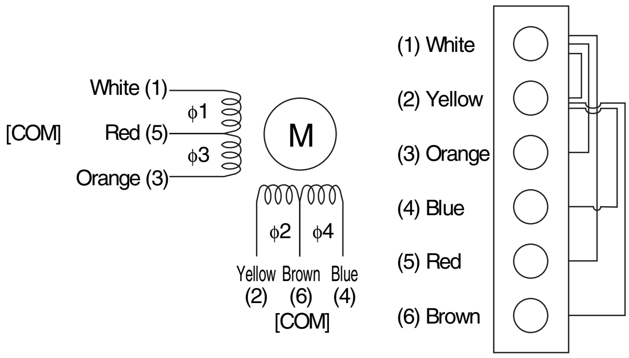
Troubleshooting

⚠ **Caution** Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



Confirmation of malfunction 3	Confirmation of malfunction 4	
◑ ○ ● ● ● ● ●	◑ ○ ○ ● ◑ ◑ ◑	→ Electronic expansion valve (Y4E)
◑ ○ ● ● ● ● ●	◑ ○ ○ ◑ ◑ ◑ ◑	→ Electronic expansion valve (Y5E)
◑ ○ ● ● ● ● ◑	◑ ○ ○ ● ◑ ◑ ◑	→ Electronic expansion valve (Y2E)
◑ ○ ● ● ● ● ◑	◑ ○ ○ ◑ ◑ ◑ ◑	→ Electronic expansion valve (Y3E)
◑ ○ ● ● ● ◑ ●	◑ ○ ○ ● ◑ ◑ ◑	→ Electronic expansion valve (Y1E)

*1: Procedure for checking the electronic expansion valve for the drive unit coil.
Disconnect the electronic expansion valve connector (X7A) from the PCB, and then make measurement of resistance and check for continuity between the connector pins to make judgement.



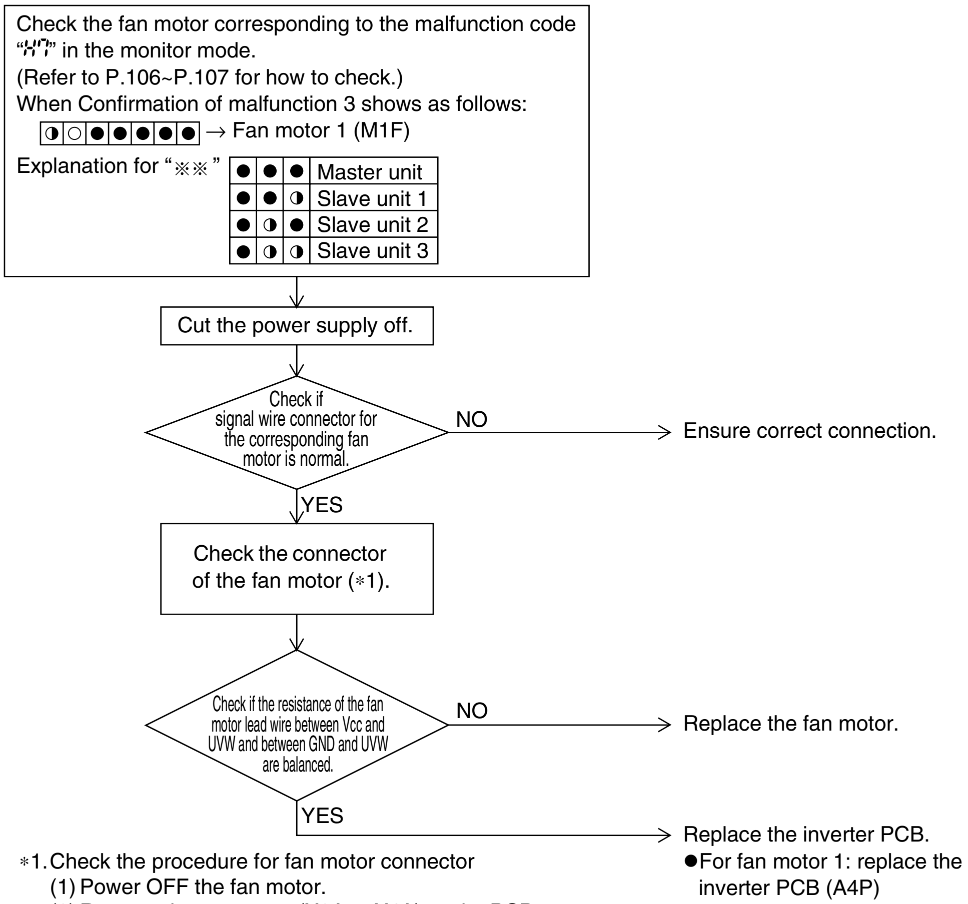
The normal states are as follows:
(1) No continuity between Pins (1) and (2)
(2) Approx. 300Ω resistance between Pins (1) and (3)
(3) Approx. 150Ω resistance between Pins (1) and (5)
(4) Approx. 300Ω resistance between Pins (2) and (4)
(5) Approx. 150Ω resistance between Pins (2) and (6)

2.16 “H7” Outdoor Unit: Abnormal Outdoor Fan Motor Signal

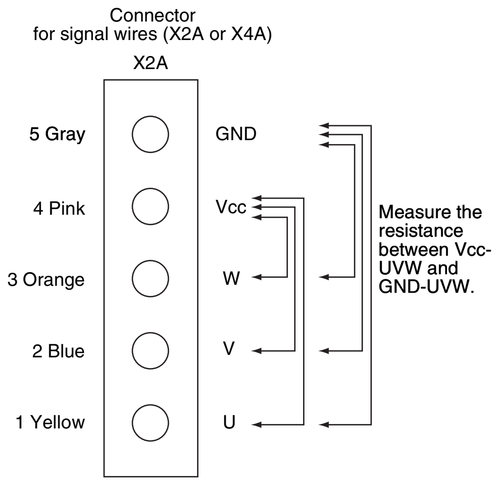
Remote Controller Display	H7
Applicable Models	RQYQ-PY1 RQEQ-PY1
Method of Malfunction Detection	Detection of abnormal signal from fan motor.
Malfunction Decision Conditions	In case of detection of abnormal signal at starting fan motor.
Supposed Causes	■ Abnormal fan motor signal (circuit malfunction) ■ Broken, short or disconnection connector of fan motor connection cable ■ Fan Inverter PCB malfunction (A2P)

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



∗1. Check the procedure for fan motor connector
(1) Power OFF the fan motor.
(2) Remove the connector (X2A or X4A) on the PCB to measure the following resistance value.
Judgement criteria: resistance value between each phase is within ±20%



2.17 “H9” Outdoor Unit: Malfunction of Thermistor (R1T) for Outdoor Air

Remote Controller Display

H9

Applicable Models

RQYQ-PY1
RQEQ-PY1

Method of Malfunction Detection

Malfunction is detected from the temperature detected by the outdoor air thermistor.

Malfunction Decision Conditions

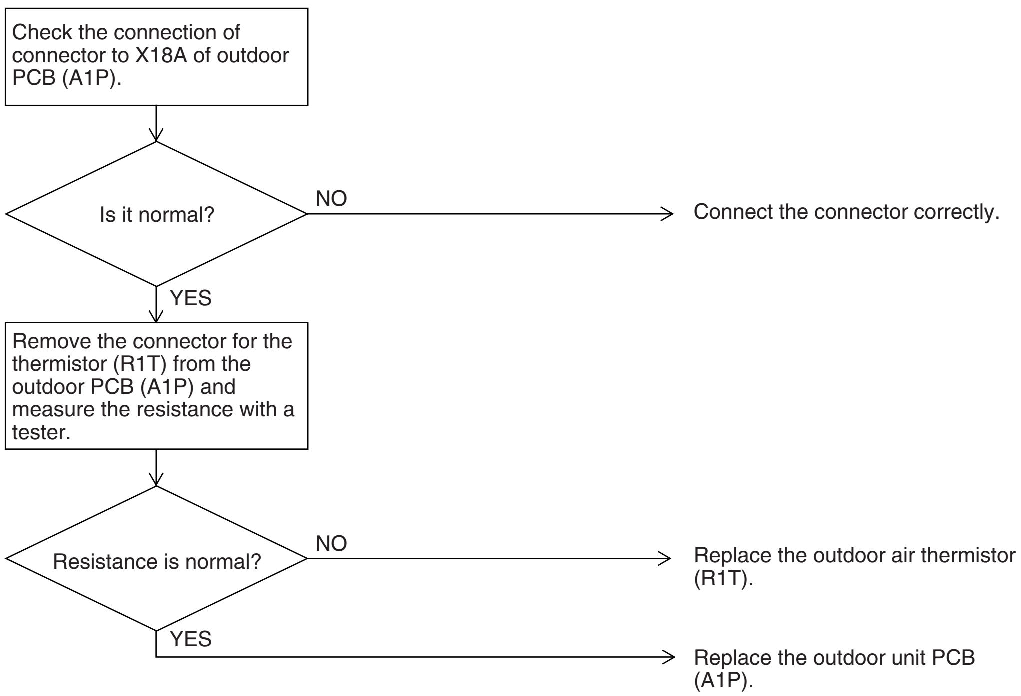
When the outdoor air temperature thermistor has short circuit or open circuit.

Supposed Causes

- Defective outdoor air thermistor connection
- Defect of outdoor air thermistor (R1T) for outdoor air
- Defect of outdoor unit PCB (A1P)

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



∗ Refer to “Thermistor Resistance / Temperature Characteristics” table on P199.

2.18 "J3, J4, J5, J6, J7, J8, J9" Outdoor Unit: Malfunction of Outdoor unit Thermistor

Remote Controller Display

J3, J4, J5, J6, J7, J8, J9

Applicable Models

RQYQ-PY1
RQEQ-PY1

Method of Malfunction Detection

Malfunction is detected from the temperature by each thermistor.

Malfunction Decision Conditions

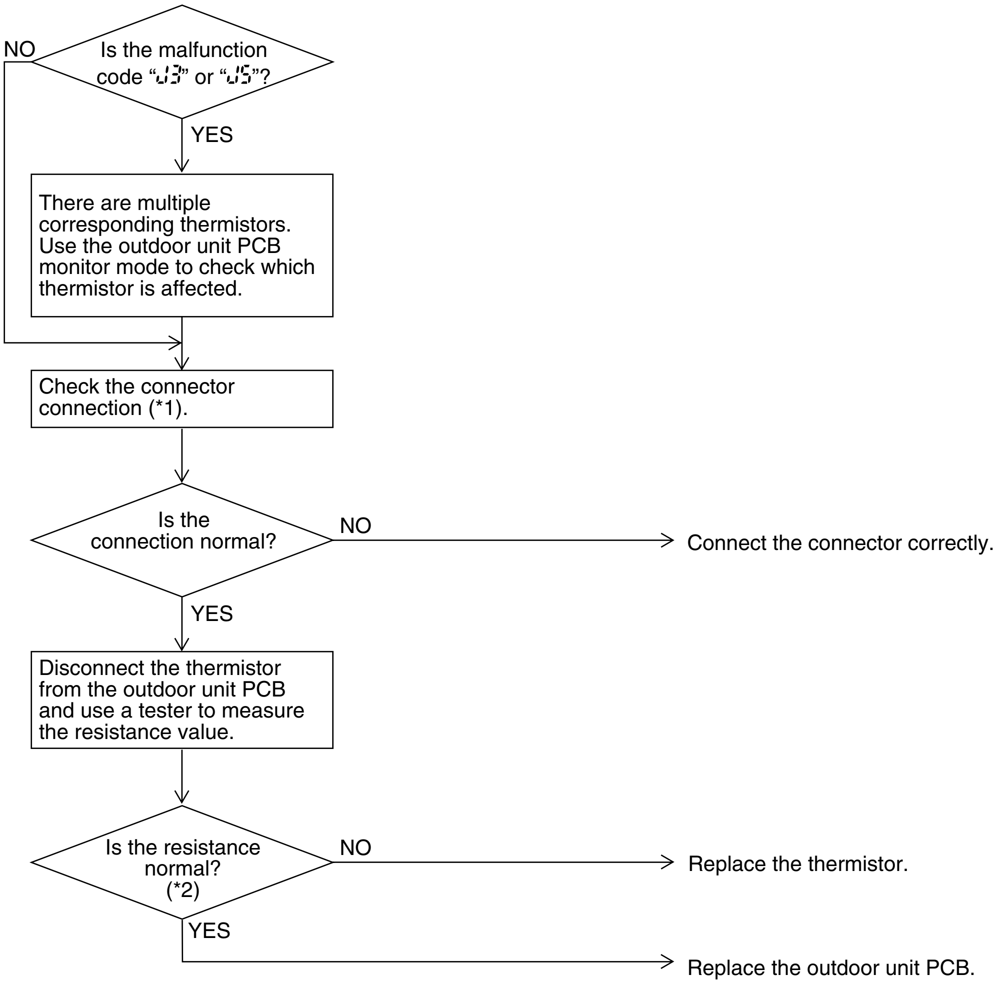
When a thermistor disconnection or short circuit occurs during operation.

Supposed Causes

- Defect of connection of thermistor
- Defect of thermistor
- Defect of outdoor unit PCB

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



*1. Malfunction code, details of trouble, and electric symbol

Malfunction code	Corresponding thermistor	Electric symbol	Connector
J3	Discharge pipe thermistor (M1C)	R2T	X29A (Collective thermistor)
	Heat exchanger liquid pipe thermistor		
J8	Heat exchanger liquid pipe thermistor	R3T	
J4	Heat exchanger gas pipe thermistor	R4T	
J5	Suction pipe thermistor	R5T	X30A (Collective thermistor)
J6	Heat exchanger thermistor	R6T	
J7	Subcooling heat exchanger liquid pipe thermistor	R8T	
	Liquid pipe thermistor	R9T	
J9	Subcooling heat exchanger gas pipe thermistor	R7T	

*2 Refer to "Thermistor Resistance / Temperature Characteristics" table on P.199.

2.19 “JA” Outdoor Unit: Malfunction of High Pressure Sensor

Remote Controller Display

JA

Applicable Models

RQYQ-PY1
RQEQ-PY1

Method of Malfunction Detection

Malfunction is detected from the pressure detected by the high pressure sensor.

Malfunction Decision Conditions

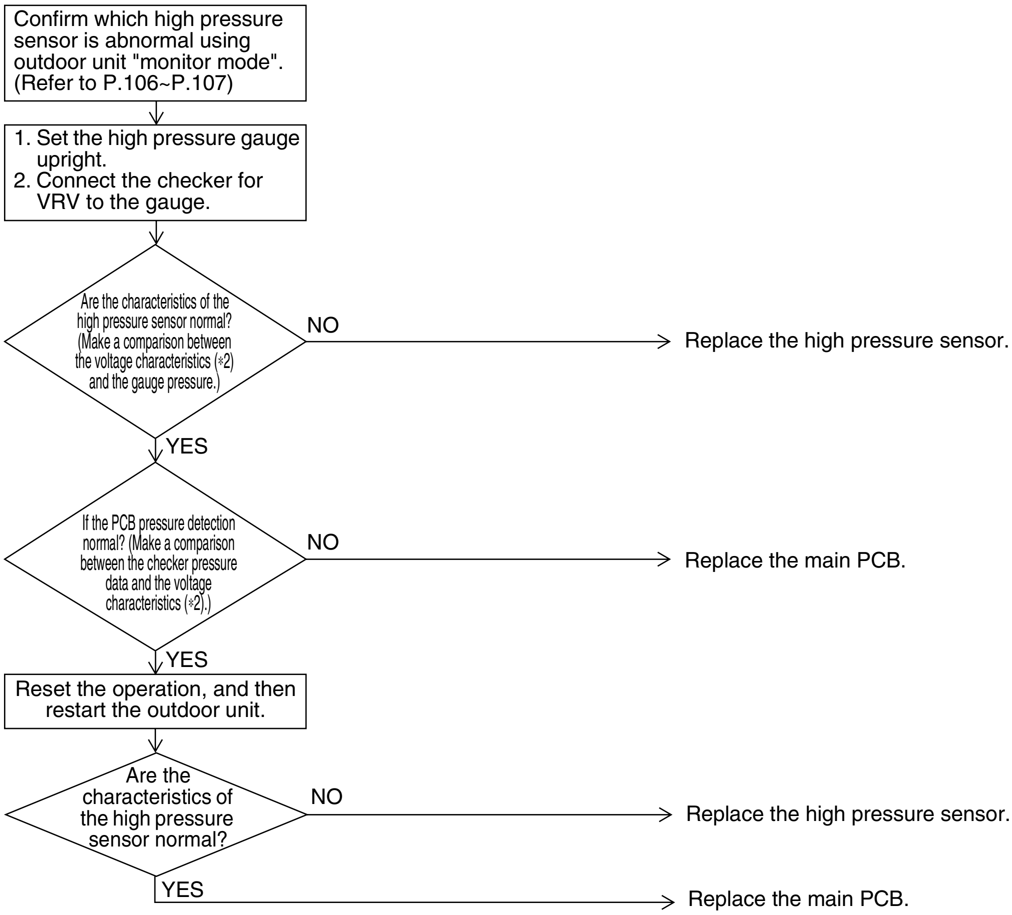
When the high pressure sensor is short circuit or open circuit.
(Not less than 4.22MPa, or 0.01MPa and below)

Supposed Causes

- Defect of high pressure sensor
- Connection of low pressure sensor with wrong connection.
- Defect of outdoor unit PCB
- Defective connection of high pressure sensor

Troubleshooting

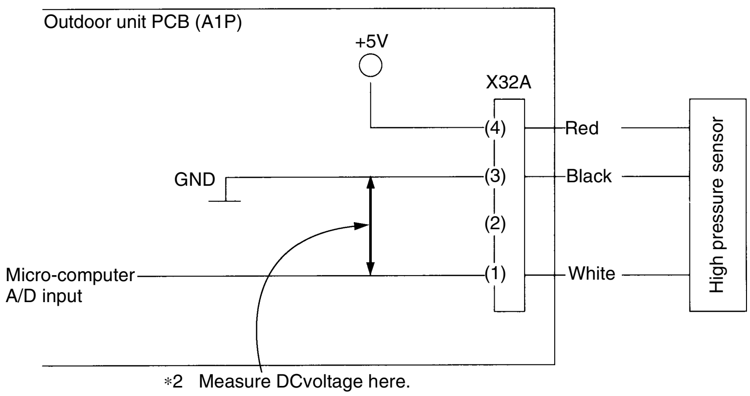
Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



*1: Pressure sensor subject to malfunction code

Malfunction code	Pressure sensor subject to malfunction code	Electric symbol
JA	High pressure sensor	S1NPH

*2: Voltage measurement point



*2: Refer to “Pressure Sensor, Pressure / Voltage Characteristics” table on P201.

2.20 "JC" Outdoor Unit: Malfunction of Low Pressure Sensor

Remote Controller Display

JC

Applicable Models

RQYQ-PY1
RQEQ-PY1

Method of Malfunction Detection

Malfunction is detected from the pressure detected by the low pressure sensor.

Malfunction Decision Conditions

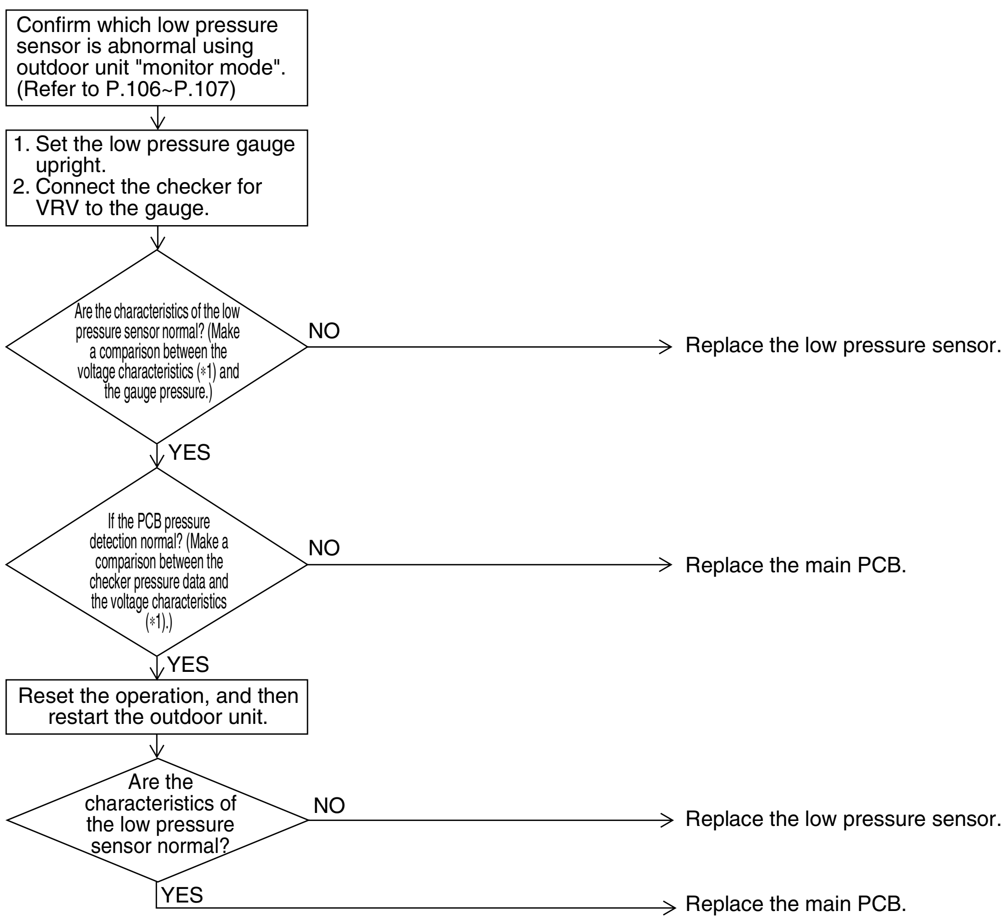
When the low pressure sensor is short circuit or open circuit.
(Not less than 1.77MPa, or -0.01MPa and below)

Supposed Causes

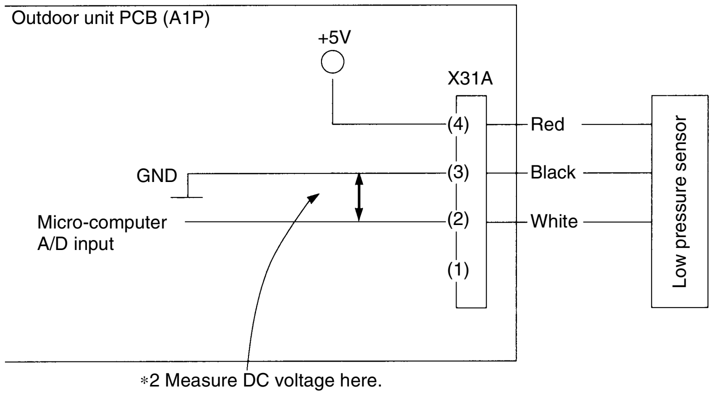
- Defect of low pressure sensor
- Connection of high pressure sensor with wrong connection.
- Defect of outdoor unit PCB
- Defective connection of low pressure sensor

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



∗1: Voltage measurement point



∗2: Refer to “Pressure Sensor, Pressure / Voltage Characteristics” table on P201.

2.21 “L1” Outdoor Unit: Malfunction of Inverter PCB

Remote Controller Display

L1

Applicable Models

RQYQ-PY1
RQEQ-PY1

Method of Malfunction Detection

- Malfunction is detected based on the current value during waveform output before starting compressor.
- Malfunction is detected based on the value from current sensor during synchronous operation when starting the unit.

Malfunction Decision Conditions

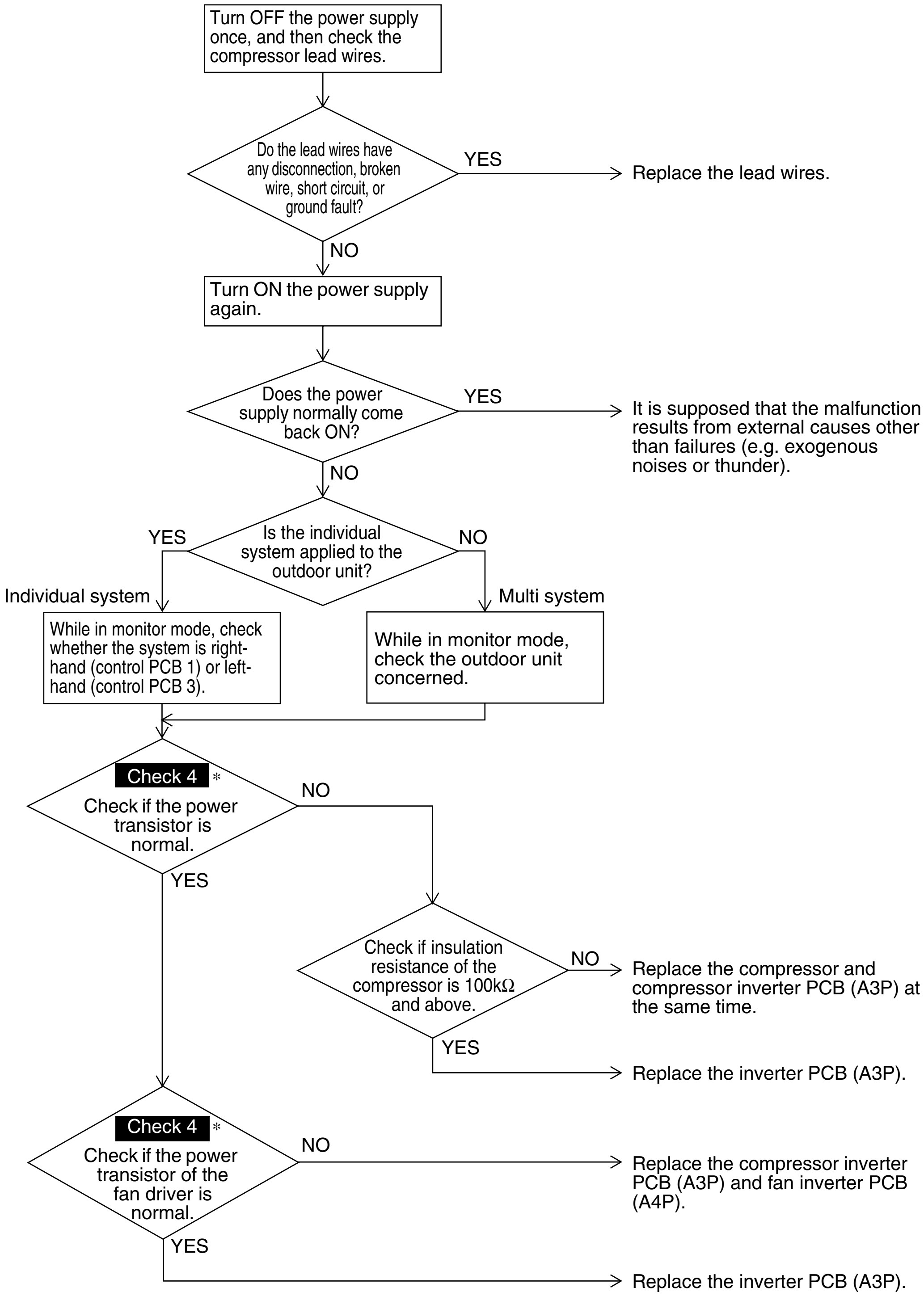
- Overcurrent (OCP) flows during waveform output.
- Malfunction of current sensor during synchronous operation.
- IPM failure.

Supposed Causes

- Inverter PCB (A3P)
  - IPM failure
  - Current sensor failure
  - Drive circuit failure

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



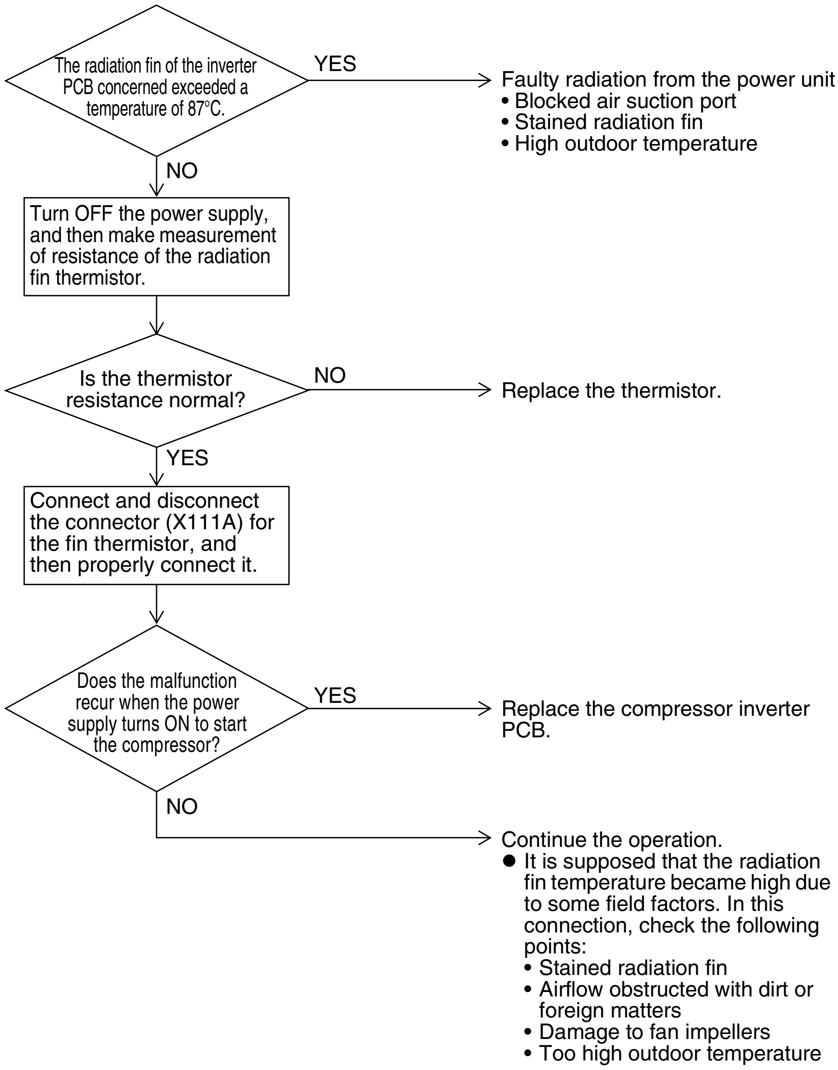
* Check 4 : Referring to the information on P.192.

2.22 "L4" Outdoor Unit: Malfunction of Inverter Radiating Fin Temperature Rise

Remote Controller Display	L4
Applicable Models	RQYQ-PY1 RQEQ-PY1
Method of Malfunction Detection	Radiation of compressor inverter PCB. Fin temperature is detected by the thermistor of the radiation fin.
Malfunction Decision Conditions	When the temperature of the inverter radiation fin increases above 87°C.
Supposed Causes	■ Actuation of fin thermal (Actuates above 87°C) ■ Defect of inverter PCB ■ Defect of fin thermistor

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



2.23 "L5" Outdoor Unit: Momentary Overcurrent of Inverter Compressor

Remote Controller Display

L5

Applicable Models

RQYQ-PY1
RQEQ-PY1

Method of Malfunction Detection

Malfunction is detected from the current flowing in the power transistor.

Malfunction Decision Conditions

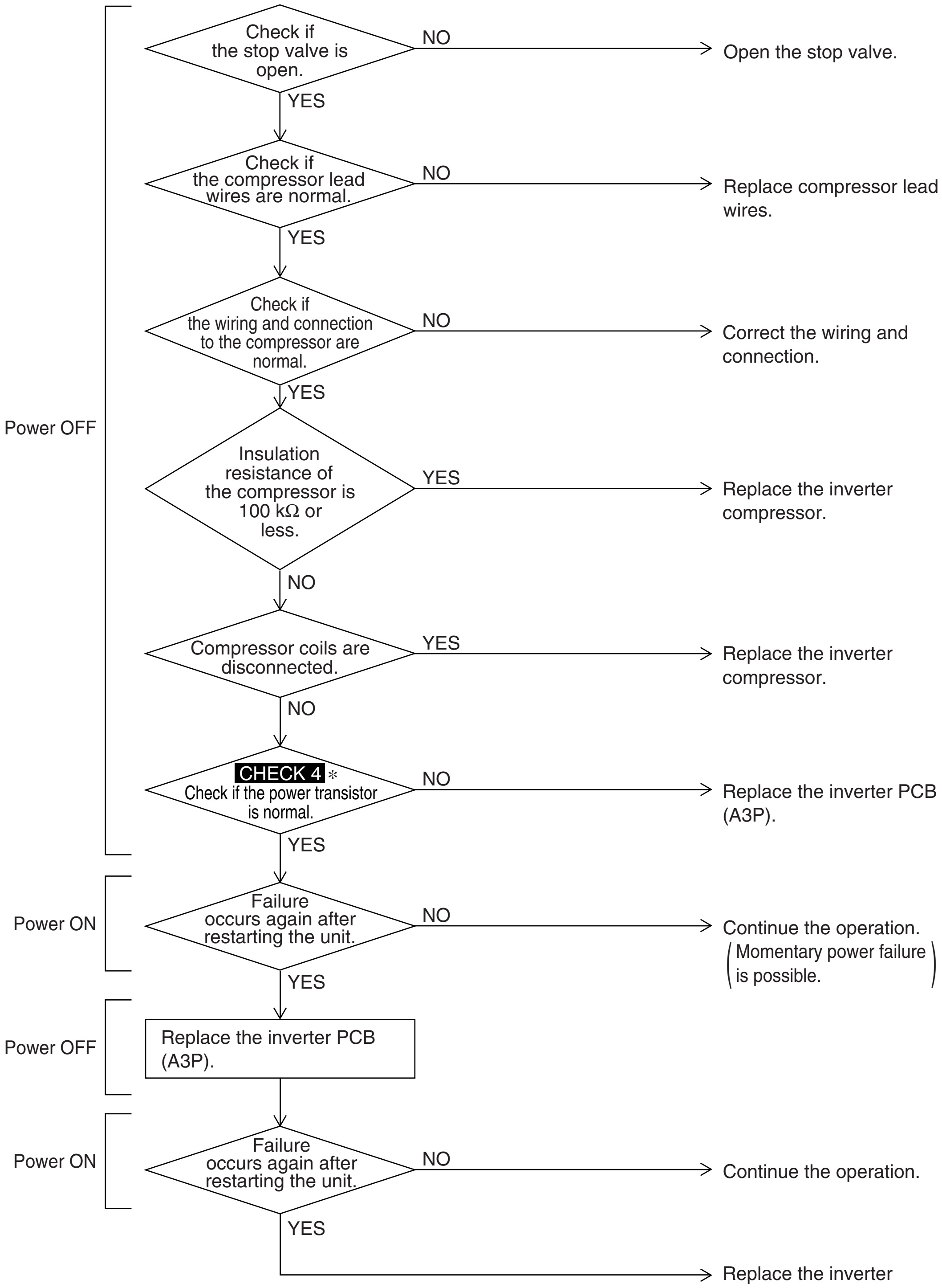
When an excessive current (59.1A) flows in the power transistor.
(Instantaneous overcurrent also causes activation.)

Supposed Causes

- Defect of compressor coil (disconnected, defective insulation)
- Compressor start-up malfunction (mechanical lock)
- Defect of inverter PCB

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



* CHECK 4 : Referring to the information on P.192.

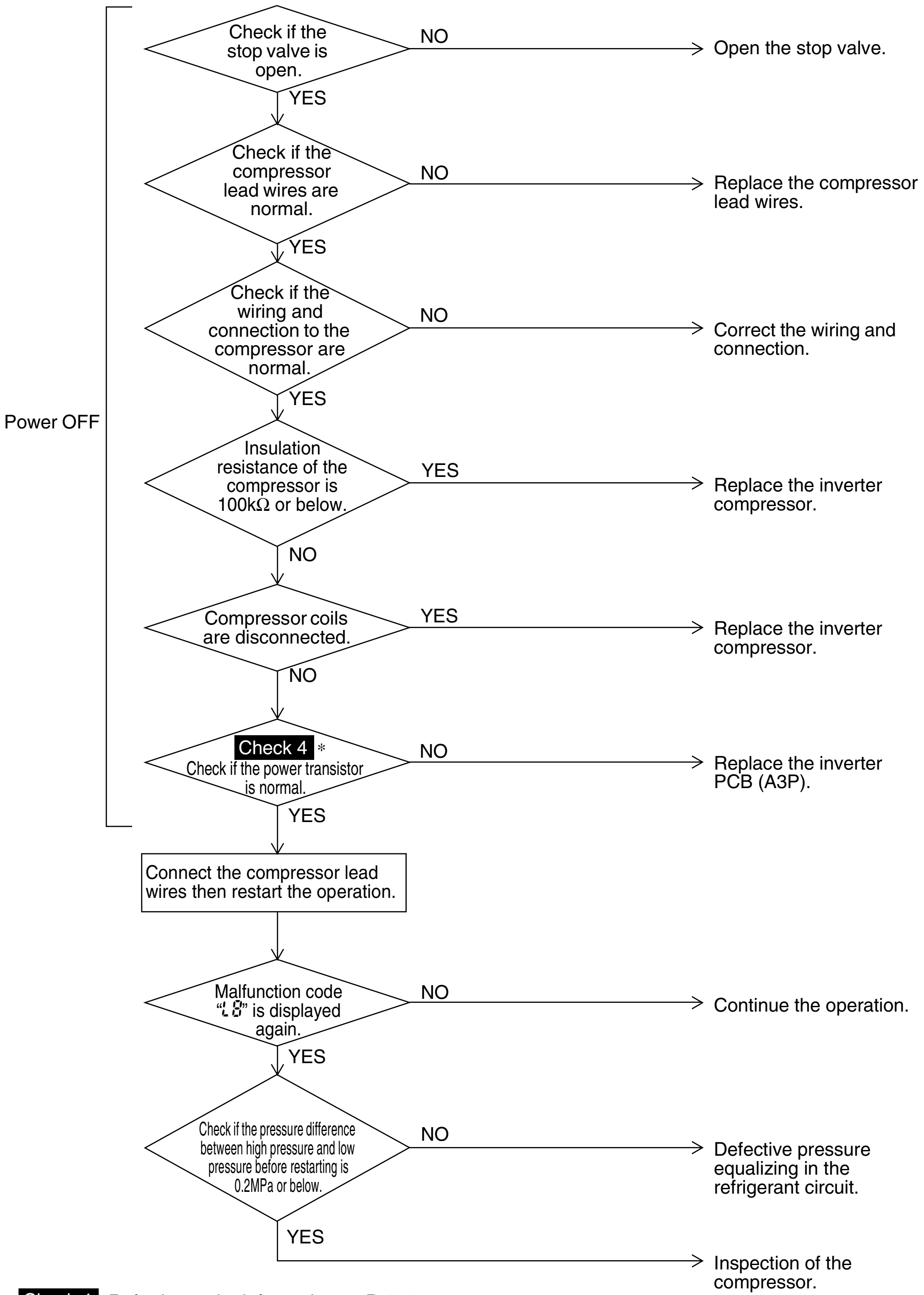
2.24 "L8" Outdoor Unit: Momentary Overcurrent of Inverter Compressor

Remote Controller Display	L8
Applicable Models	RQYQ-PY1 RQEQ-PY1
Method of Malfunction Detection	Malfunction is detected from the current flowing in the power transistor.
Malfunction Decision Conditions	When the inverter secondary current value is below. (1) 33.5A and over continues for 5 seconds. (2) 27.6A and over continues for 260 seconds.
Supposed Causes	■ Compressor overload ■ Compressor coil disconnected ■ Defect of wiring or connection to the compressor ■ Defect of inverter PCB

Troubleshooting

Output current check

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



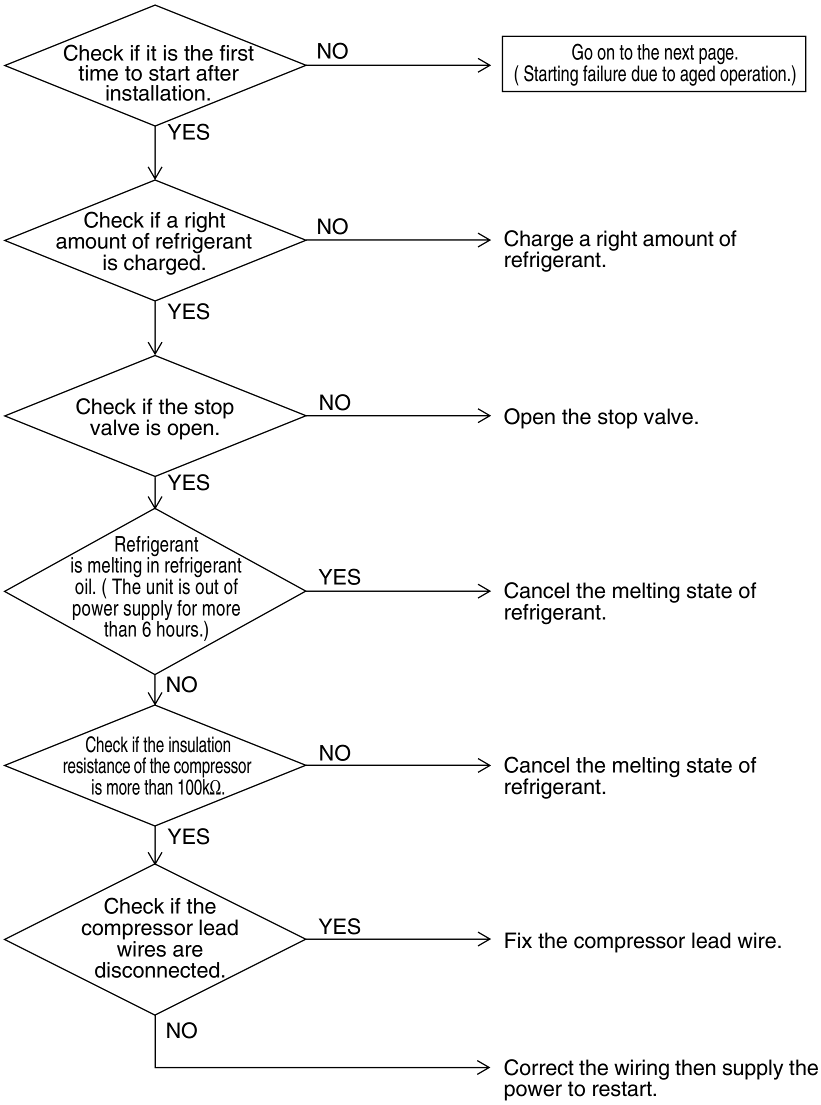
* Check 4 : Referring to the information on P.192.

2.25 "L9" Outdoor Unit: Inverter Compressor Starting Failure

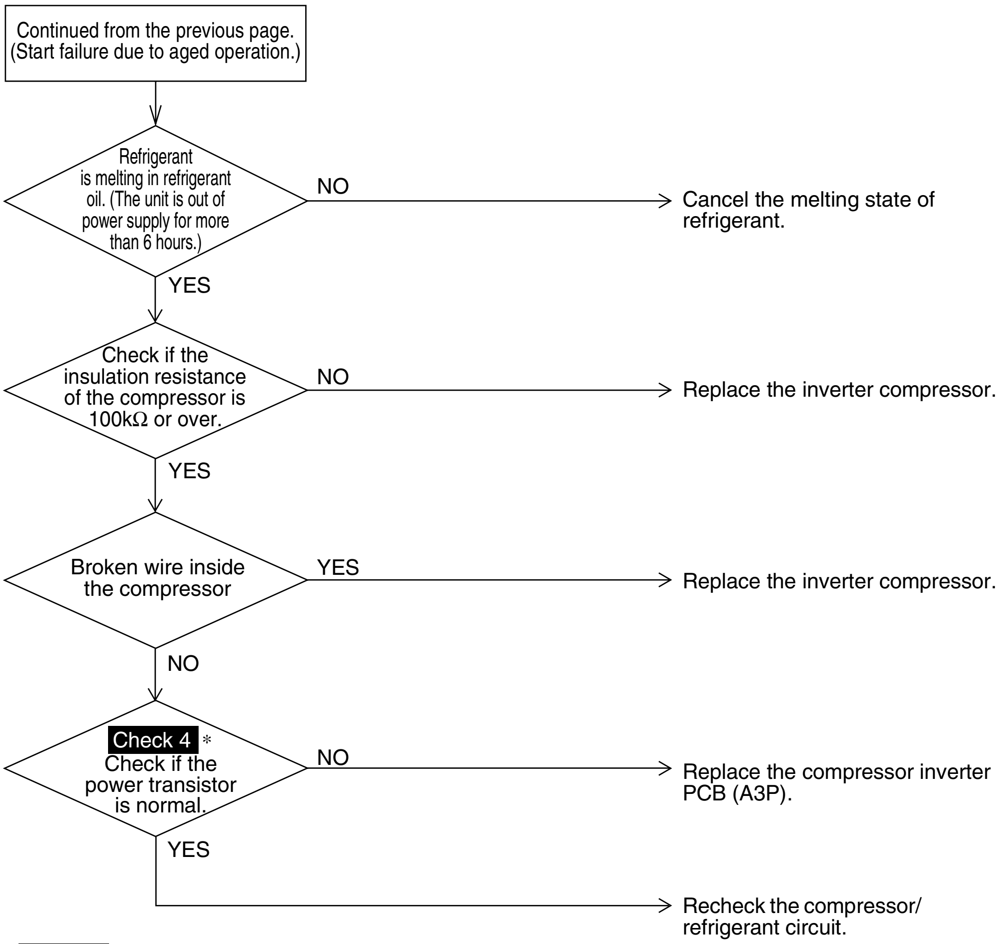
Remote Controller Display	L9
Applicable Models	RQYQ-PY1 RQEQ-PY1
Method of Malfunction Detection	Detect the failure based on the signal waveform of the compressor.
Malfunction Decision Conditions	Starting the compressor does not complete.
Supposed Causes	■ Failure to open the stop valve ■ Defective compressor ■ Wiring connection error to the compressor ■ Large pressure difference before starting the compressor ■ Defective inverter PCB

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



Troubleshooting



* Check 4: Referring to the information on P.192.

2.26 "LC" Outdoor Unit: Malfunction of Transmission between Inverter and Main PCB

Remote Controller Display

LC

Applicable Models

RQYQ-PY1
RQEQ-PY1

Method of Malfunction Detection

Check the communication state between inverter PCB and main PCB by micro-computer.

Malfunction Decision Conditions

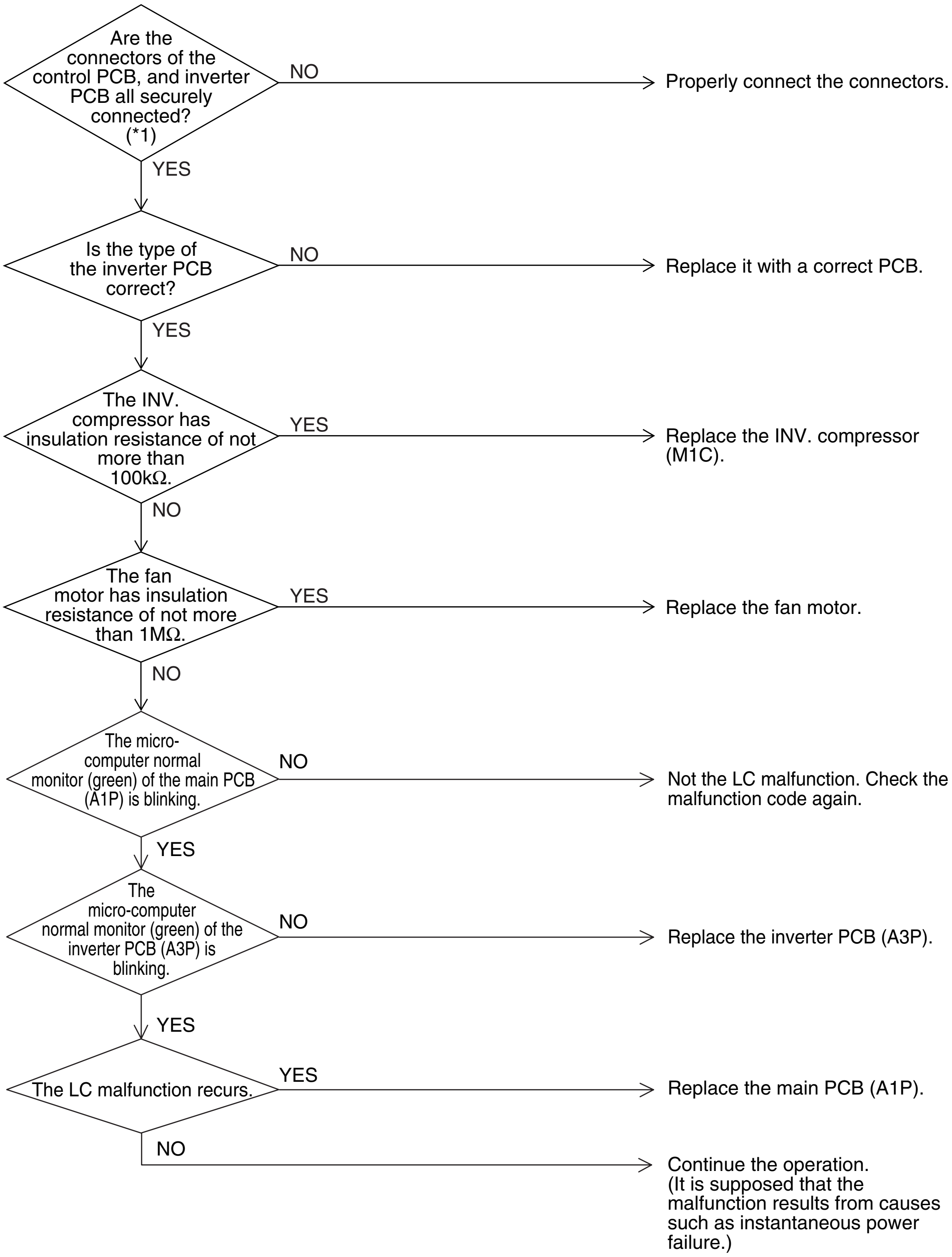
When the correct communication is not conducted in certain period.

Supposed Causes

- Malfunction of connection between the inverter PCB and outdoor main PCB
- Defect of outdoor main PCB (transmission section)
- Defect of inverter PCB
- Defect of noise filter
- External factor (noise etc.)
- Faulty inverter compressor
- Faulty fan motor

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



*1. Disconnect the connector once, then reconnect it and check that it is securely connected.

2.27 "P1" Outdoor Unit: Inverter Over-Ripple Protection

Remote Controller Display

P1

Applicable Models

RQYQ-PY1
RQEQ-PY1

Method of Malfunction Detection

Imbalance in supply voltage is detected in PCB.

Malfunction Decision Conditions

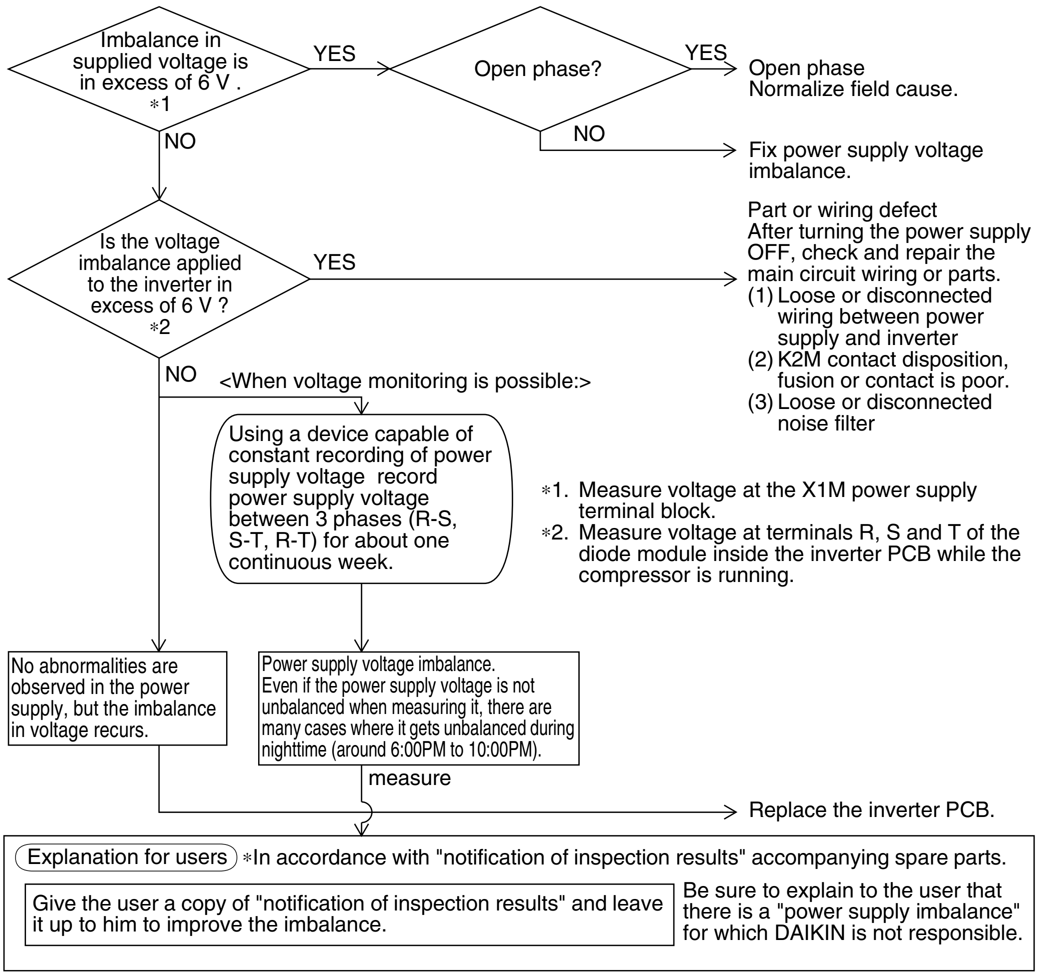
When the amplitude of the ripple exceeding 6V is detected.
Malfunction is not decided while the unit operation is continued.
"P1" will be displayed by pressing the inspection button.

Supposed Causes

- Open phase
- Voltage imbalance between phases
- Defect of main circuit capacitor
- Defect of inverter PCB
- Defect of K2M relay in inverter PCB
- Improper main circuit wiring

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



2.28 “P4” Outdoor Unit: Malfunction of Inverter Radiating Fin Temperature Rise Sensor

Remote Controller Display

P4

Applicable Models

RQYQ-PY1
RQEQ-PY1

Method of Malfunction Detection

Resistance of radiation fin thermistor is detected when the compressor is not operating.

Malfunction Decision Conditions

When the resistance value of thermistor becomes a value equivalent to open or short circuited status.

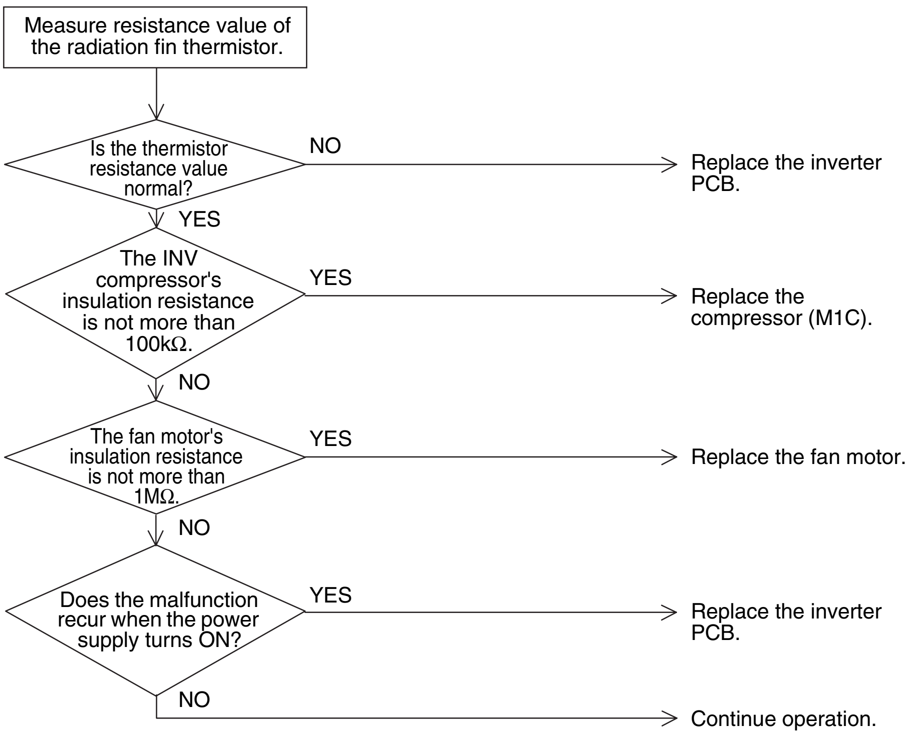
★ Malfunction is not decided while the unit operation is continued.
"P4" will be displayed by pressing the inspection button.

Supposed Causes

- Defect of radiation fin thermistor
- Defect of inverter PCB
- Faulty inverter compressor
- Faulty fan motor

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

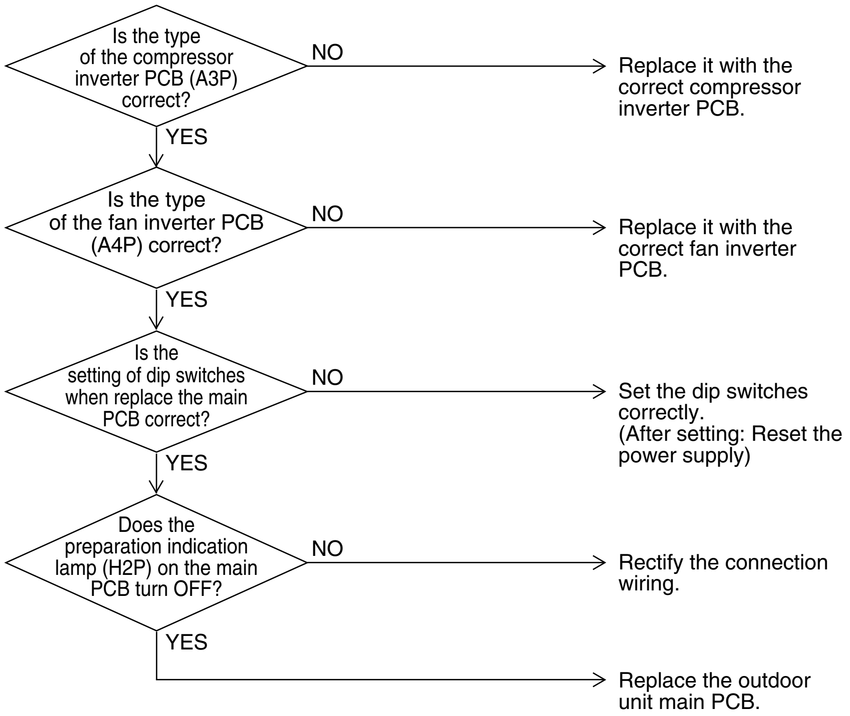


2.29 “PJ” Outdoor Unit: Faulty Field Setting after Replacing Main PCB or Faulty Combination of PCB

Remote Controller Display	PJ
Applicable Models	RQYQ-PY1 RQEQ-PY1
Method of Malfunction Detection	This malfunction is detected according to communications with the inverter.
Malfunction Decision Conditions	Make judgement according to communication data on whether or not the type of the inverter PCB is correct.
Supposed Causes	■ Mismatching of type of PCB ■ Faulty (or no) field setting after replacing main PCB

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



2.30 "U1" Reverse Phase, Open Phase

Remote Controller Display

U1

Applicable Models

RQYQ-PY1
RQEQ-PY1

Method of Malfunction Detection

The phase of each phase are detected by reverse phase detection circuit and right phase or reverse phase are judged.

Malfunction Decision Conditions

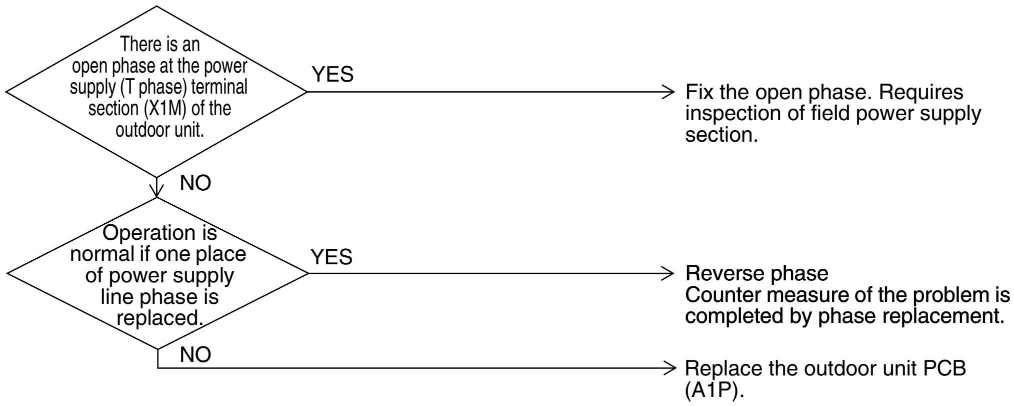
When a power supply is reverse phase, or T phase is open phase.

Supposed Causes

- Power supply reverse phase
- T phase open phase
- Defect of outdoor PCB (A1P)

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



2.31 "U2" Outdoor Unit: Power Supply Insufficient or Instantaneous Failure

Remote Controller Display

U2

Applicable Models

RQYQ-PY1
RQEQ-PY1

Method of Malfunction Detection

Detection of voltage of main circuit capacitor built in the inverter and power supply voltage.

Malfunction Decision Conditions

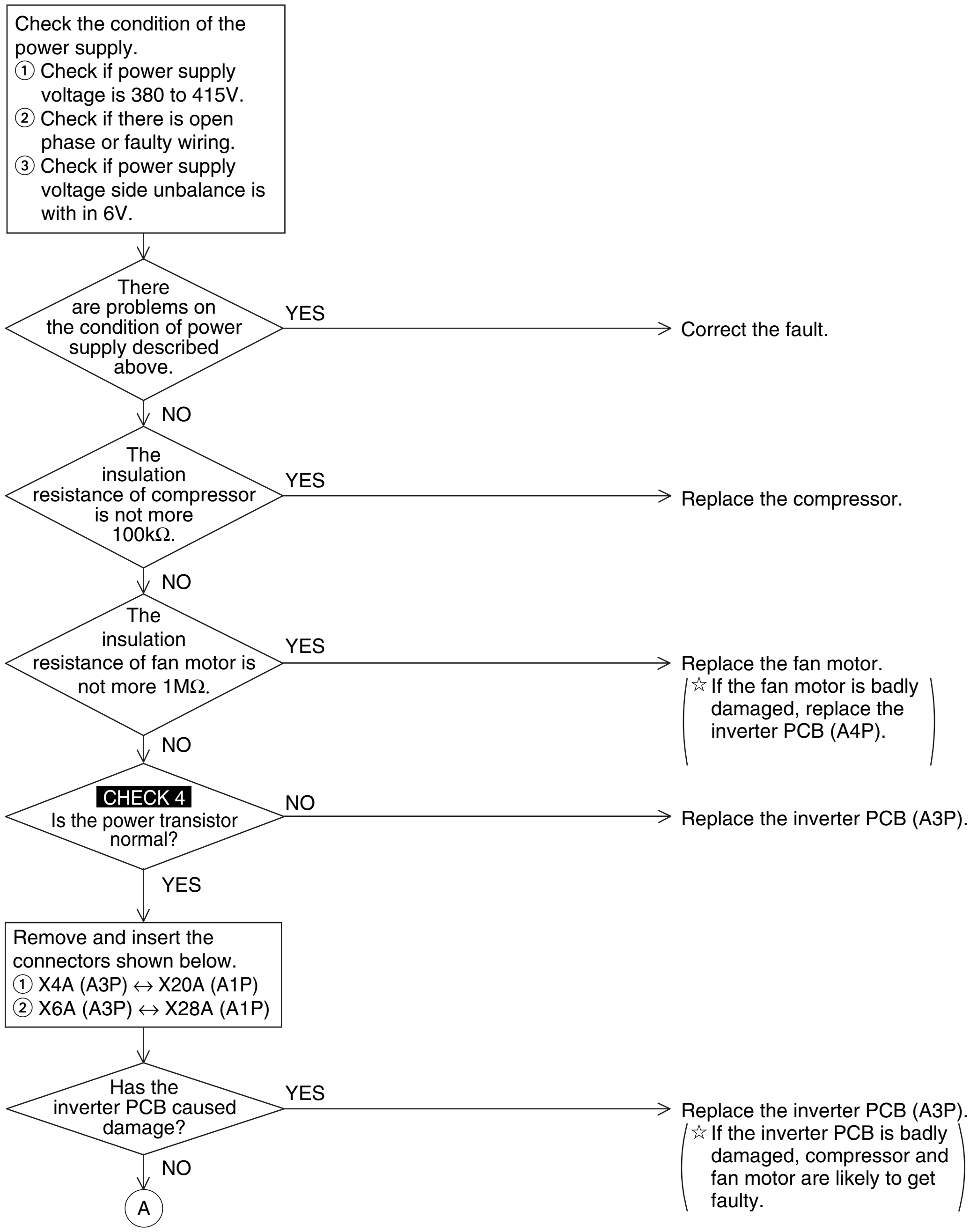
When the voltage aforementioned is not less than 190V.

Supposed Causes

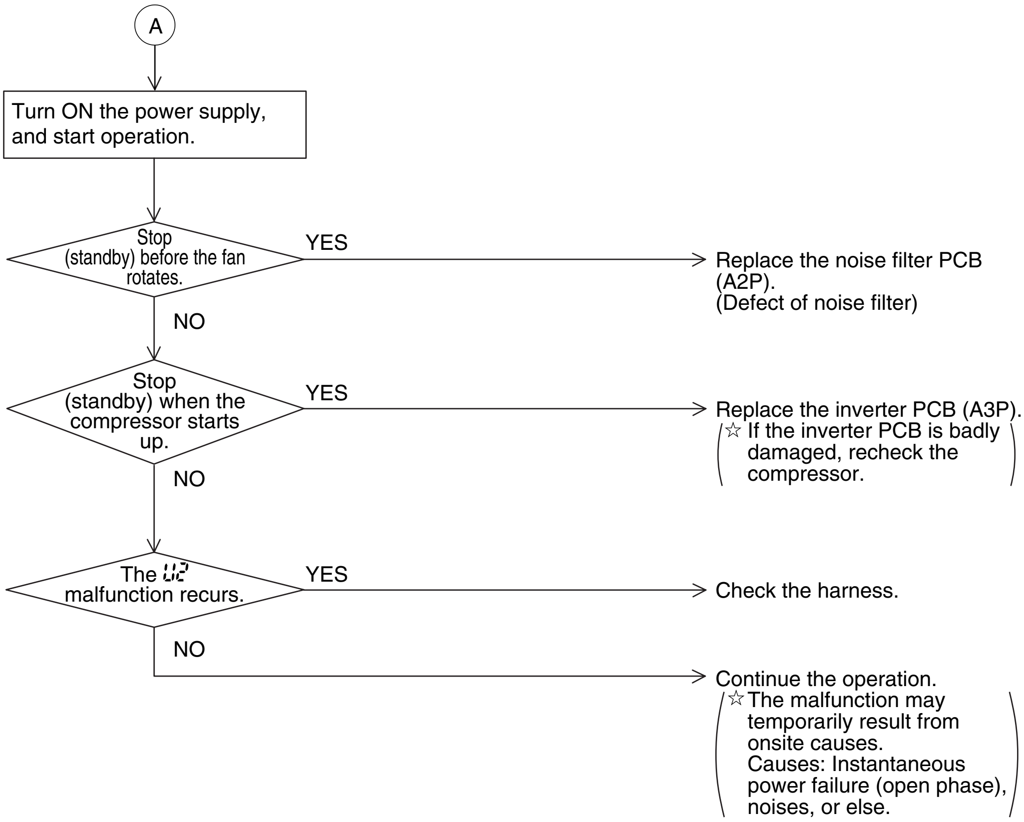
- Power supply insufficient
- Instantaneous power failure
- Open phase
- Defect of inverter PCB
- Defect of outdoor control PCB
- Faulty compressor
- Defect of main circuit wiring
- Faulty fan motor
- Faulty connection of signal cable

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



Troubleshooting

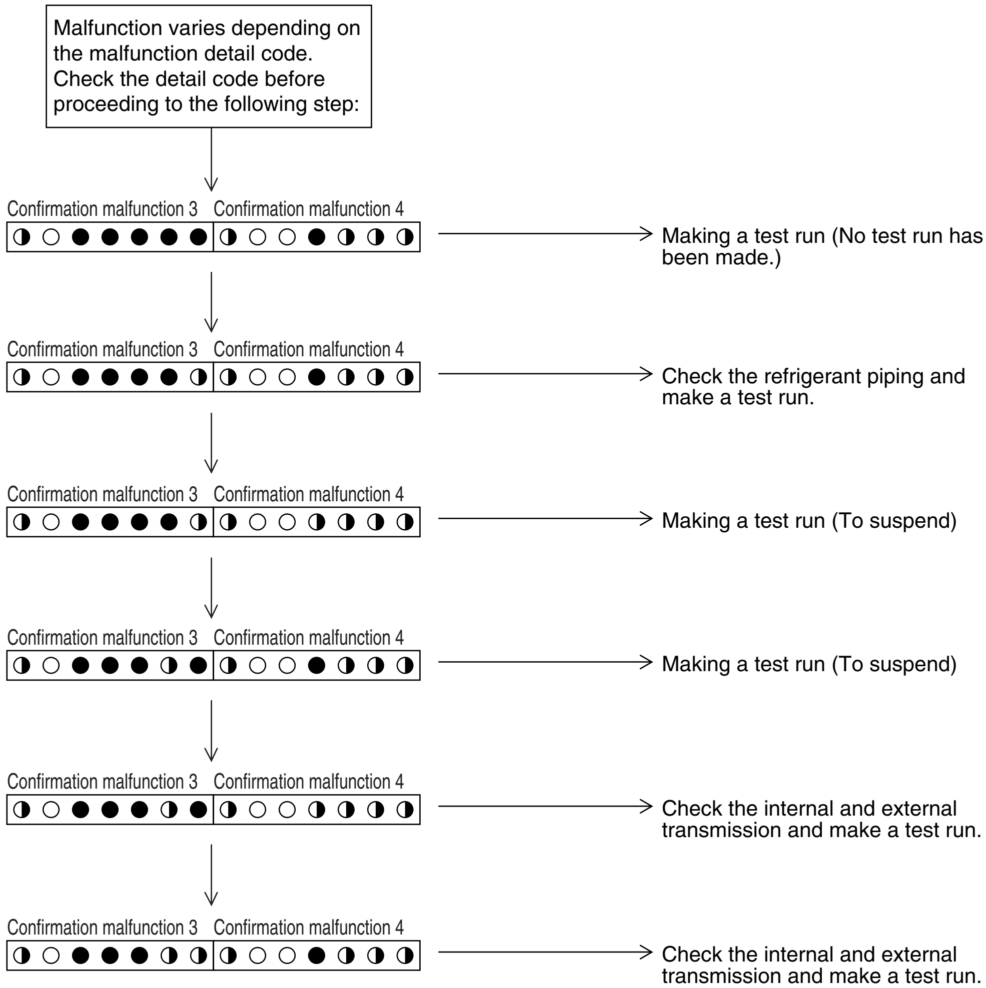


2.32 "U3" Outdoor Unit: Check Operation is not Executed

Remote Controller Display	U3
Applicable Models	RQYQ-PY1 RQEQ-PY1
Method of Malfunction Detection	Check operation is executed or not
Malfunction Decision Conditions	Malfunction is decided when the unit starts operation without check operation.
Supposed Causes	■ Check operation is not executed.

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



2.33 "U4" Malfunction of Transmission between Indoor Units and Outdoor Units

Remote Controller Display

U4

Applicable Models

All indoor unit models
RQYQ-PY1
RQEQ-PY1

Method of Malfunction Detection

Check if the transmission between indoor unit and outdoor unit is correctly executed using micro-computer.

Malfunction Decision Conditions

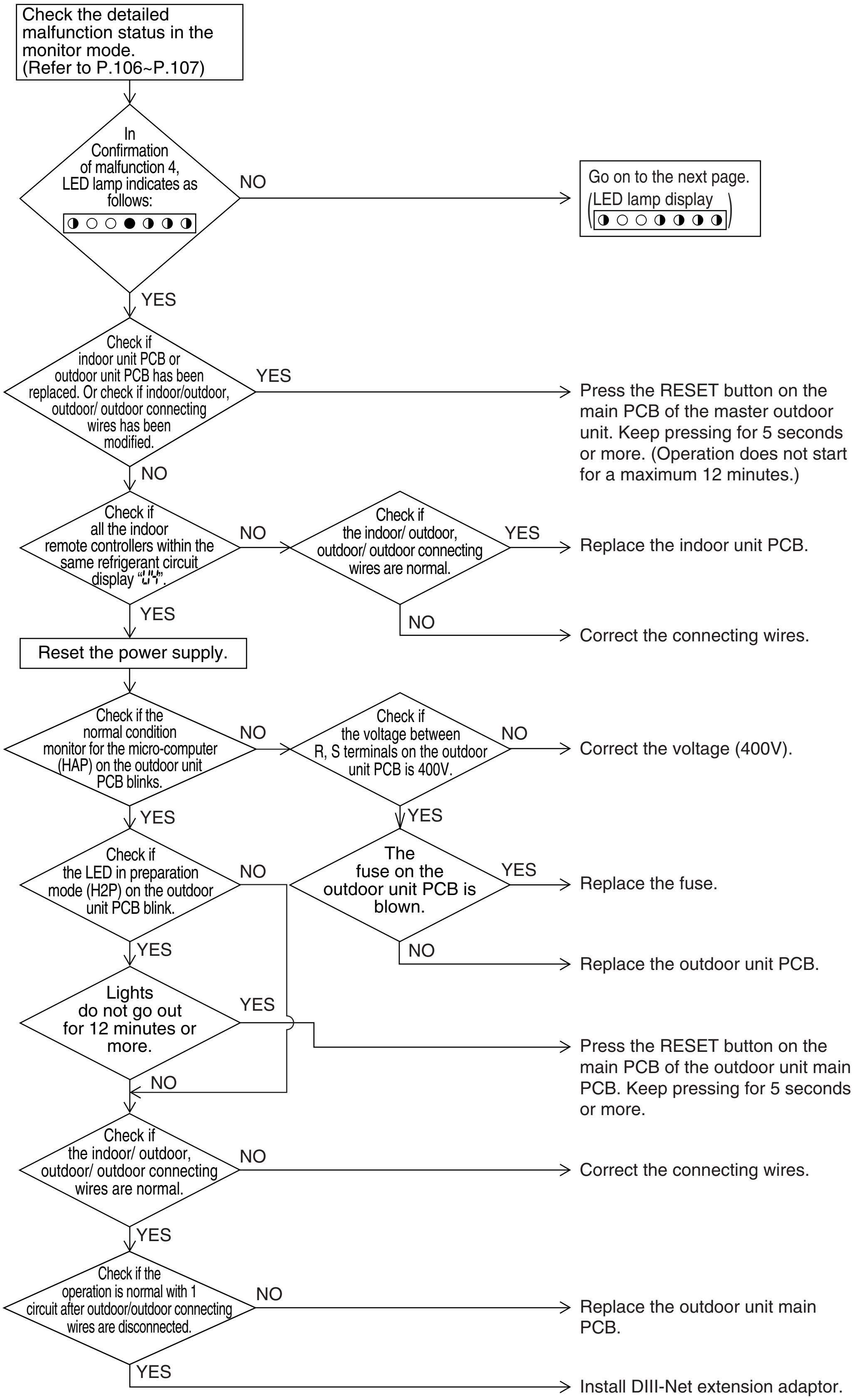
When transmission is not carried out normally for a certain amount of time

Supposed Causes

- Indoor to outdoor, outdoor to outdoor transmission wiring F1, F2 disconnection, short circuit or wrong wiring
- Outdoor unit power supply is OFF
- System address does not match
- Defect of outdoor unit main PCB (A1P)
- Defect of indoor unit PCB

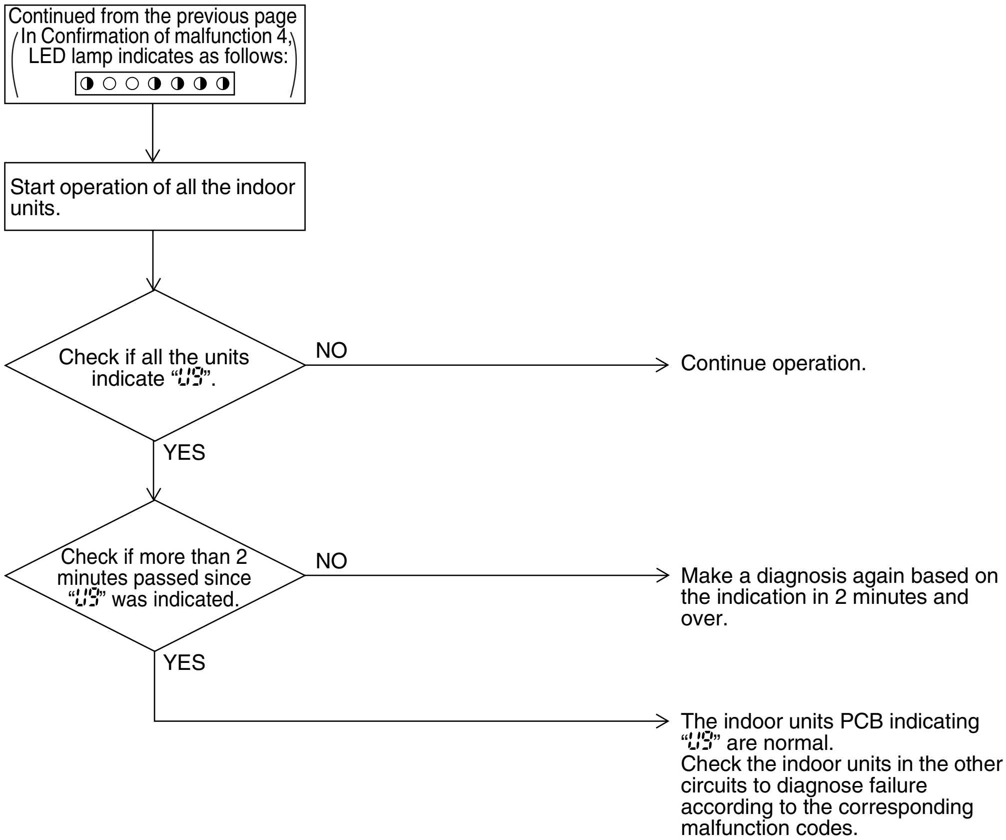
Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



2.34 "U7" Outdoor Unit: Transmission Failure (Across Outdoor Units)

Remote Controller Display

U7

Applicable Models

RQYQ-PY1
RQEQ-PY1

Method of Malfunction Detection

Micro-computer checks if transmission between outdoor units is normal.

Malfunction Decision Conditions

When transmission is not carried out normally for a certain amount of time

Supposed Causes

- Connection error in connecting wires between outdoor unit and external control adaptor for outdoor unit
- Connection error in connecting wires across outdoor units
- Setting error in switching cooling/ heating
- Unified address setting error for cooling/ heating
(function unit, external control adaptor for outdoor unit)
- Defective outdoor unit PCB (A1P)
- Defective of external control adaptor for outdoor unit

Troubleshooting

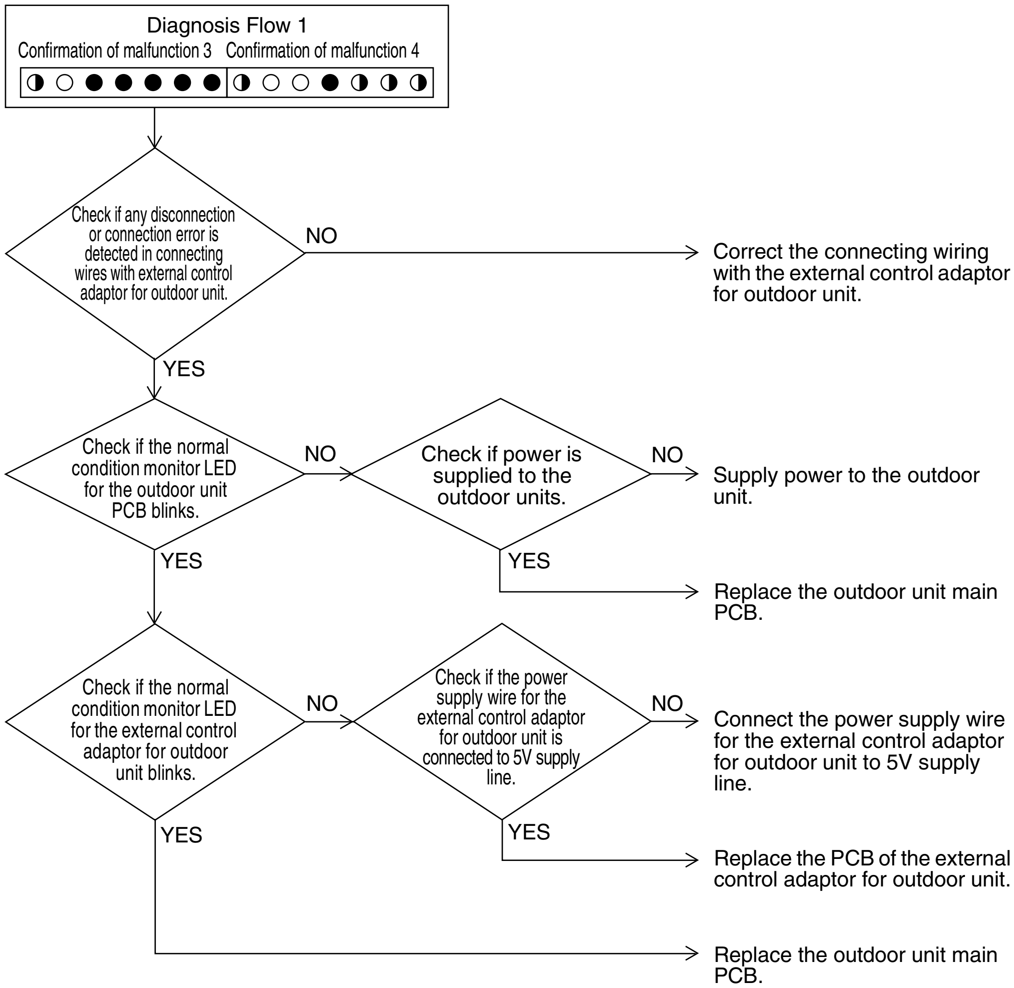
Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

Check the LED lamps for "Confirmation of malfunction 3" corresponding to the malfunction code "U7" and for Confirmation of malfunction 4 in the monitor mode.

Confirmation of malfunction 3	Confirmation of malfunction 4	
◑ ○ ● ● ● ● ●	◑ ○ ○ ● ◑ ◑ ◑	Go on to the Diagnosis Flow 1 (Faulty transmission caused when the external control adaptor is mounted)
◑ ○ ● ● ● ● ●	◑ ○ ○ ◑ ◑ ◑ ◑	Go on to the Diagnosis Flow 2 (Transmission alarm given when the external control adaptor is mounted)
◑ ○ ● ● ● ● ◑	◑ ○ ○ ● ◑ ◑ ◑	Go on to the Diagnosis Flow 3 (Abnormal transmission between the master unit and the slave unit 1)
◑ ○ ● ● ● ● ◑	◑ ○ ○ ◑ ◑ ◑ ◑	Go on to the Diagnosis Flow 4 (Abnormal transmission between the master unit and the slave unit 2)
◑ ○ ● ● ◑ ● ●	◑ ○ ○ ◑ ◑ ◑ ◑	Go on to the Diagnosis Flow 5 (Faulty auto address of the slave units 1, 2 and 3)
◑ ○ ● ● ● ◑ ◑	◑ ○ ○ ◑ ◑ ◑ ◑	Go on to the Diagnosis Flow 6 (Erroneous manual address settings of the slave units 1, 2 and 3)
◑ ○ ● ● ◑ ● ●	◑ ○ ○ ● ◑ ◑ ◑	Go on to the Diagnosis Flow 7 (Connection of five or more outdoor units to the same circuit)
◑ ○ ● ● ● ◑ ●	◑ ○ ○ ● ◑ ◑ ◑	Go on to the Diagnosis Flow 8 (Abnormal transmission between the master unit and the slave unit 3)
◑ ○ ● ● ◑ ● ◑	◑ ○ ○ ◑ ◑ ◑ ◑	Go on to the Diagnosis Flow 9 (Indoor connection capacity malfunction by a test run)
◑ ○ ● ● ◑ ● ◑	◑ ○ ○ ● ◑ ◑ ◑	Go on to the Diagnosis Flow 10 (BS alarm (cooling/heating unified ADP))

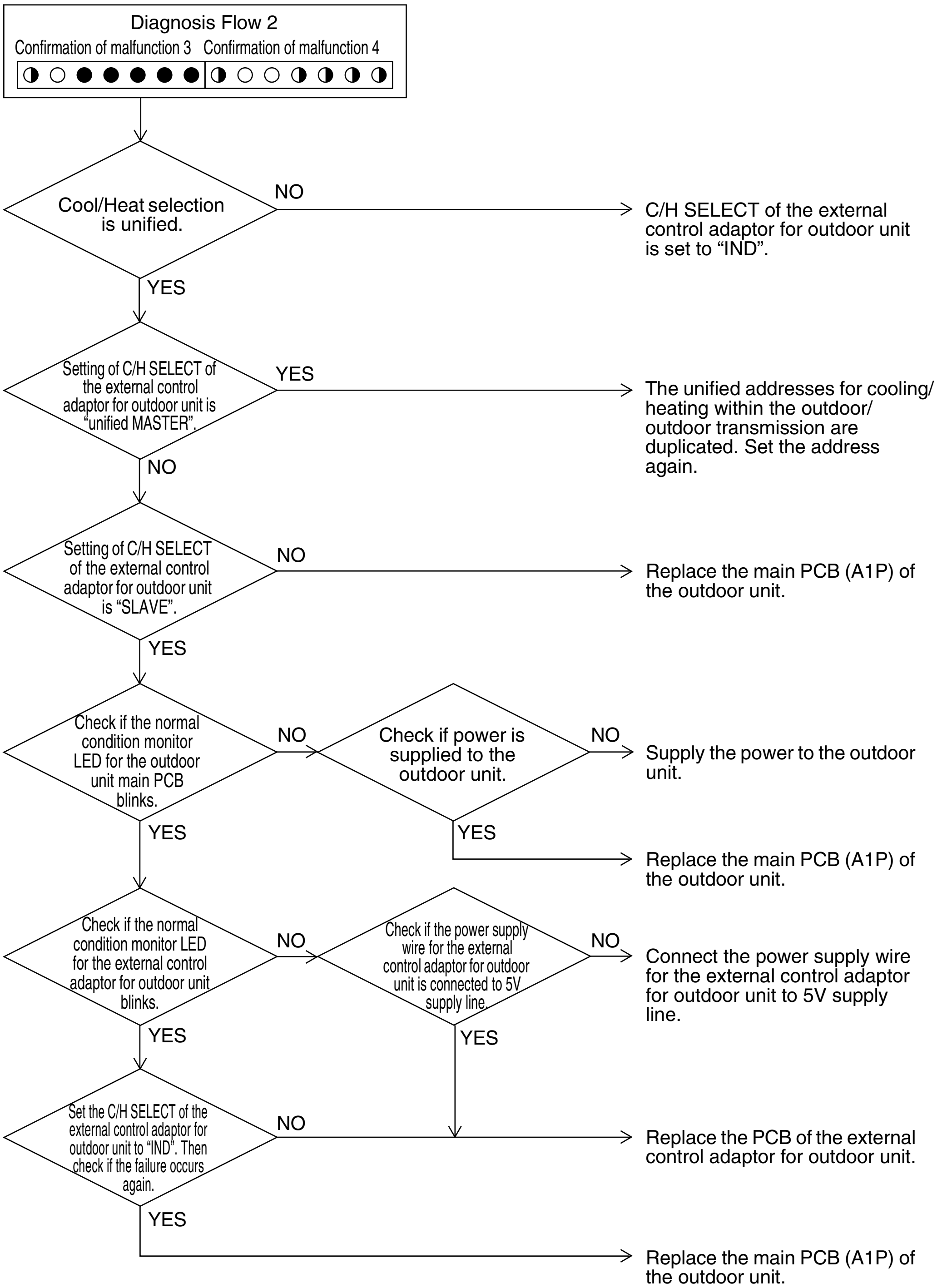
Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



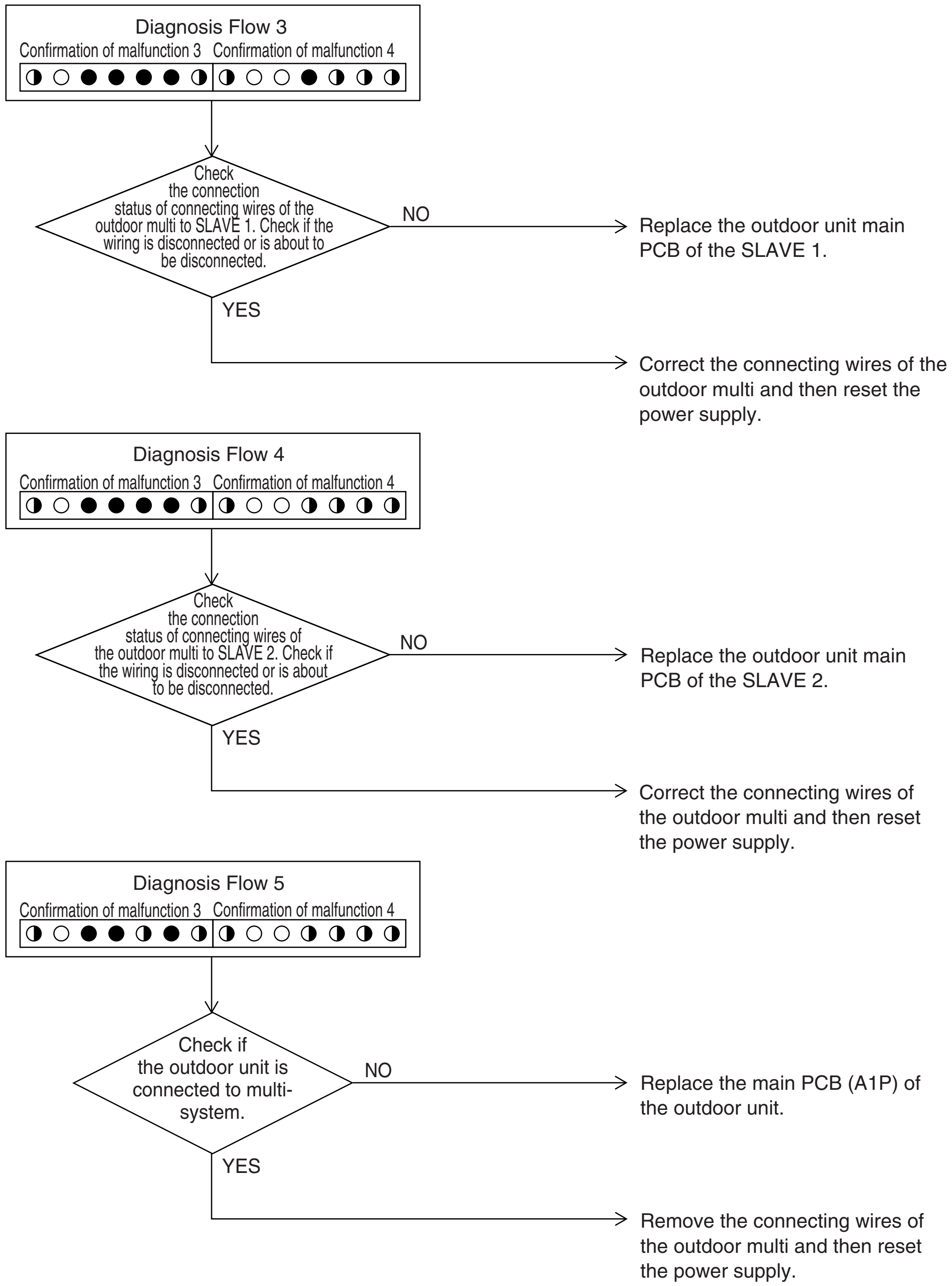
Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



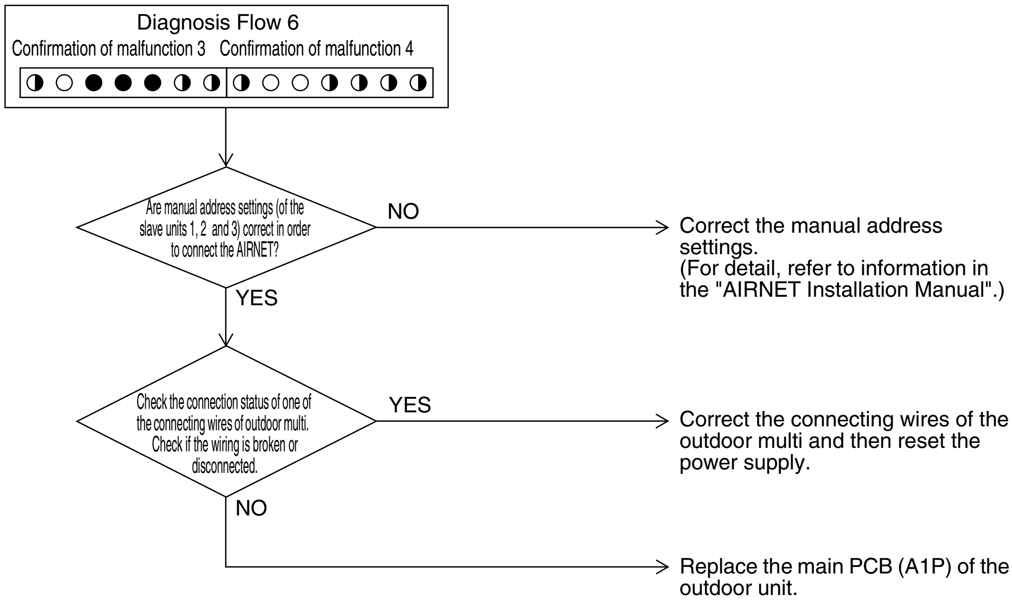
Troubleshooting

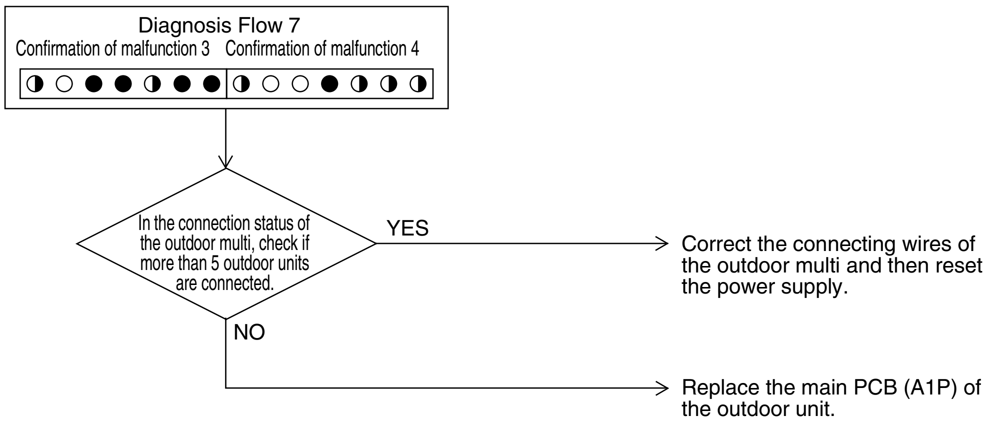
Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

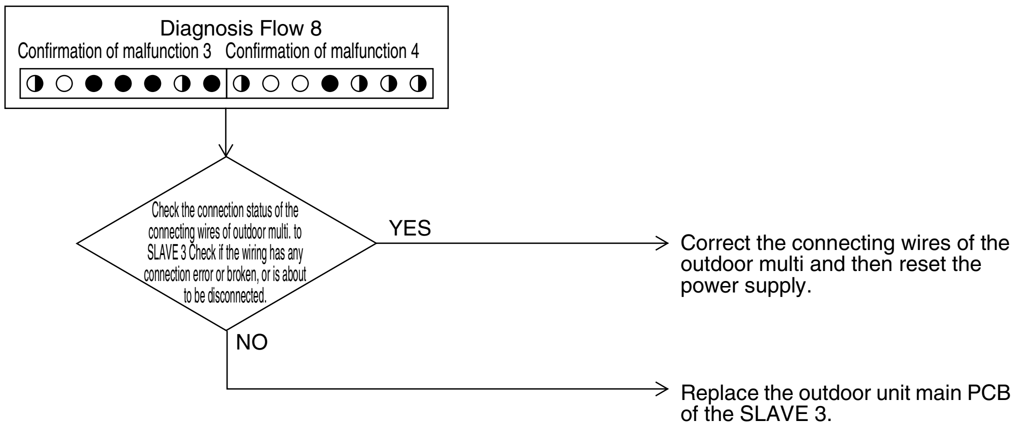


Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

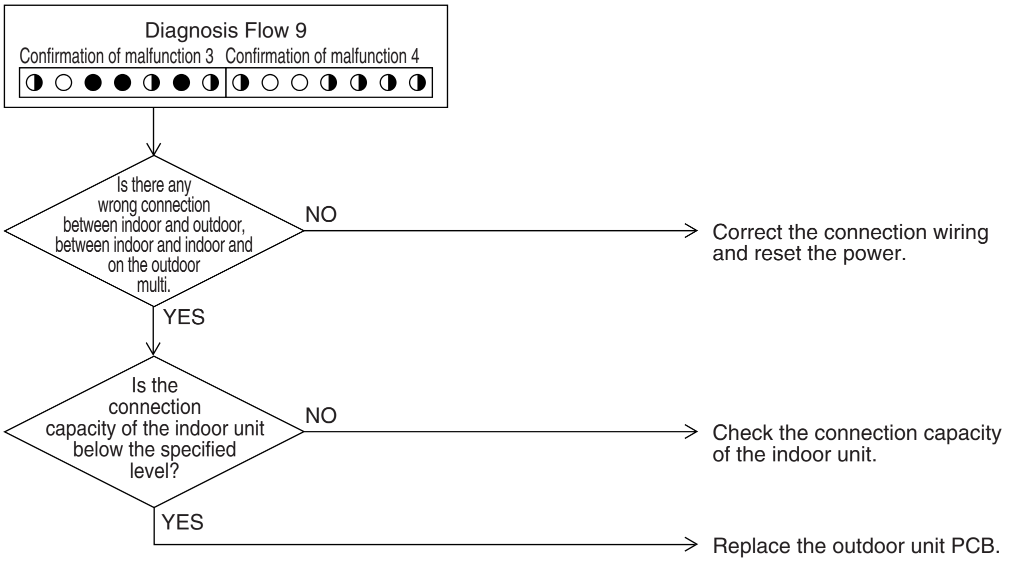


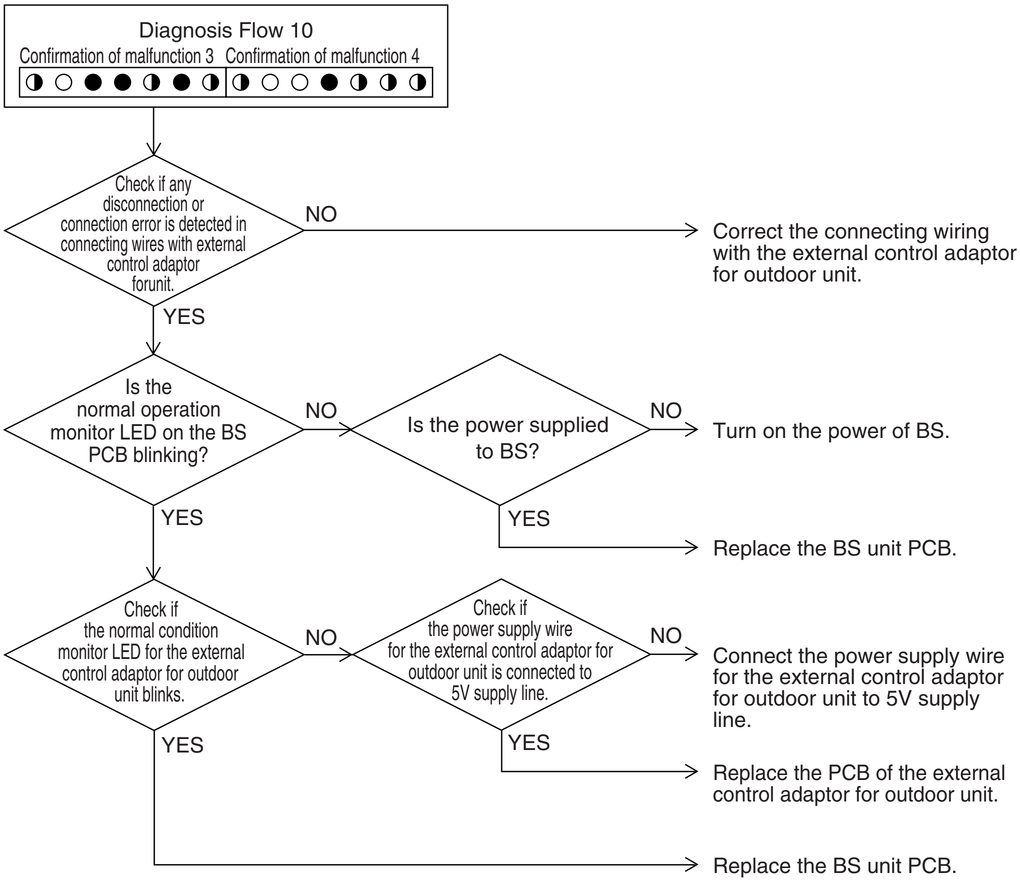




Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.





2.35 "U8" Indoor Unit: Malfunction of Transmission between Main and Sub Remote Controllers

Remote Controller Display

U8

Applicable Models

All indoor unit models

Method of Malfunction Detection

In case of controlling with 2-remote controller, check the system using micro-computer if signal transmission between indoor unit and remote controller (main and sub) is normal.

Malfunction Decision Conditions

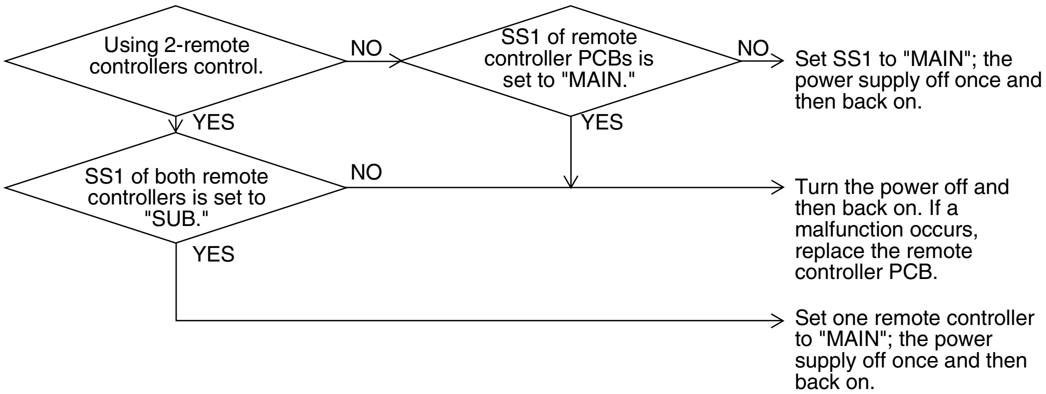
Normal transmission does not continue for specified period.

Supposed Causes

- Malfunction of transmission between main and sub remote controller
- Connection between sub remote controllers
- Defect of remote controller PCB

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



2.36 "U9" Indoor Unit: Malfunction of Transmission between Indoor and Outdoor Units in the Same System

Remote Controller Display

U9

Applicable Models

All indoor unit models
RQYQ-PY1
RQEQ-PY1

Method of Malfunction Detection

Detect malfunction signal for the other indoor units within the circuit by outdoor unit PCB.

Malfunction Decision Conditions

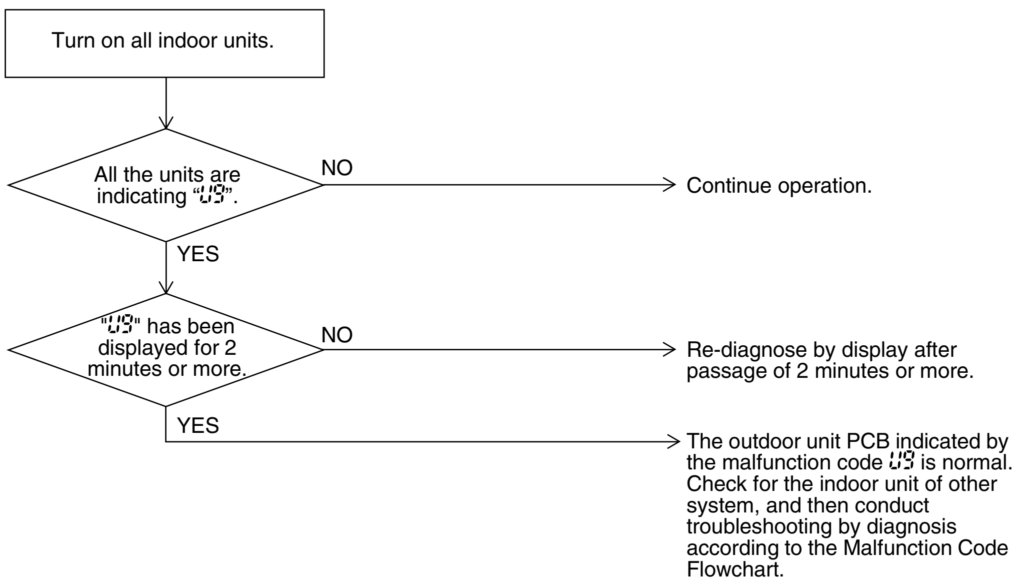
When the malfunction decision is made on any other indoor unit within the system concerned.

Supposed Causes

- Malfunction of transmission within or outside of other system
- Malfunction of electronic expansion valve in indoor unit of other system
- Defect of PCB of indoor unit in other system
- Improper connection of transmission wiring between indoor and outdoor unit

Troubleshooting

⚠ **Caution** Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



2.37 "UA" Improper Combination of Indoor, BS and Outdoor Units, Indoor Units and Remote Controller

Remote Controller Display

UA

Applicable Models

All indoor unit models
BSVQ100~250P
RQYQ-PY1
RQEQ-PY1

Method of Malfunction Detection

A difference occurs in data by the type of refrigerant between indoor, BS and outdoor units.
The number of indoor units is out of the allowable range.
Incorrect signals are transmitted among the indoor unit, BS unit, and outdoor unit.

Malfunction Decision Conditions

The malfunction decision is made as soon as either of the abnormalities aforementioned is detected.

Supposed Causes

- Excess of connected indoor units
- Defect of outdoor unit PCB (A1P)
- Mismatching of the refrigerant type of indoor and outdoor unit.
- Setting of outdoor PCB was not conducted after replacing to spare parts PCB.

Troubleshooting

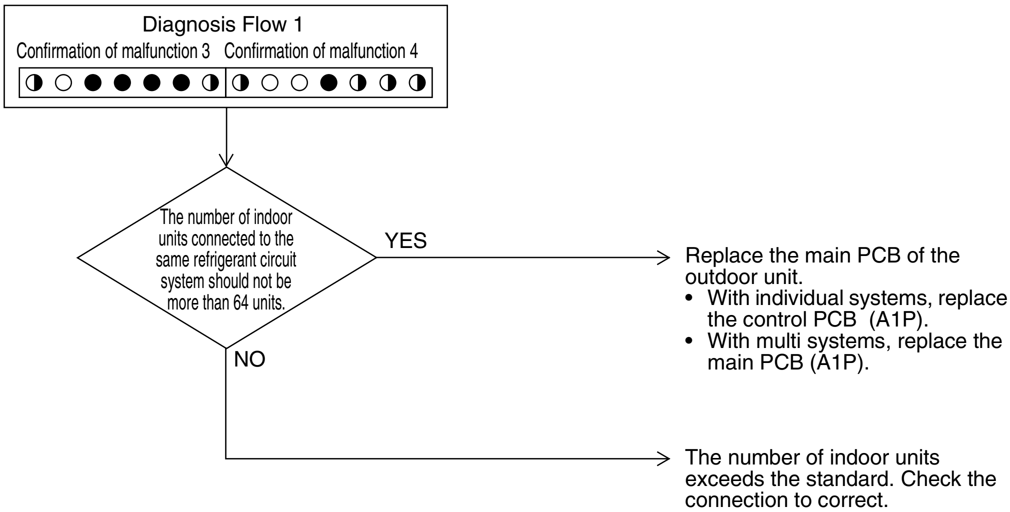
⚠ **Caution** Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

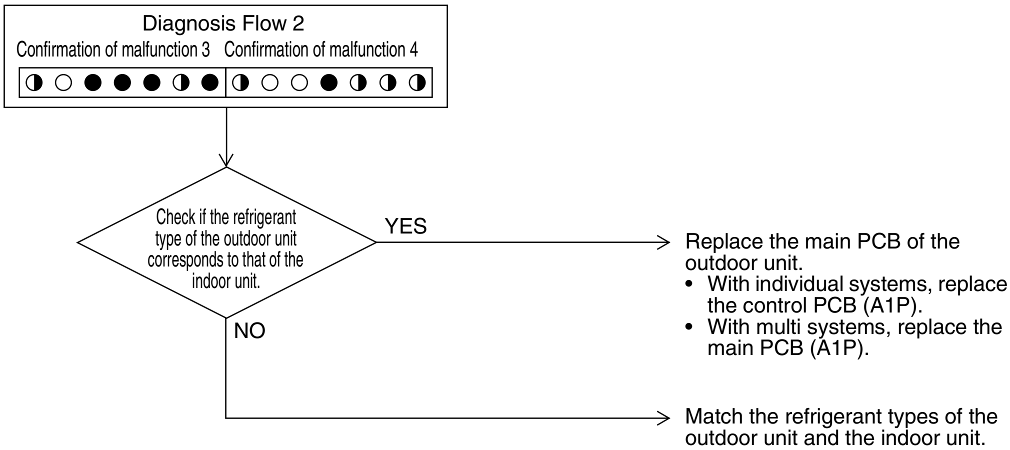
Check the LED lamps for “Confirmation of malfunction 3” corresponding to the malfunction code “UA” and for Confirmation of malfunction 4 in the monitor mode. (Refer to P.106~P.107 for how to check.)

Confirmation of malfunction 3	Confirmation of malfunction 4	
◑ ○ ● ● ● ● ●	◑ ○ ○ ● ◑ ◑ ◑	To Diagnosis Flow 1 (Excessive number of indoor units connected)
◑ ○ ● ● ● ◑ ●	◑ ○ ○ ● ◑ ◑ ◑	To Diagnosis Flow 2 (Connection of erroneous models of indoor units)
◑ ○ ● ● ● ◑ ●	◑ ○ ○ ◑ ◑ ◑ ◑	To Diagnosis Flow 3 (Faulty combination of outdoor units)
◑ ○ ● ● ◑ ● ●	◑ ○ ○ ◑ ◑ ◑ ◑	To Diagnosis Flow 4 (Faulty wiring in units dedicated to multi connections)
◑ ○ ● ● ◑ ● ●	◑ ○ ○ ● ◑ ◑ ◑	To Diagnosis Flow 5 (Connection of erroneous models of BS units)
◑ ○ ● ● ◑ ◑ ●	◑ ○ ○ ● ◑ ◑ ◑	To Diagnosis Flow 6 (Faulty wiring between outdoor units and BS units)
◑ ○ ● ● ◑ ◑ ●	◑ ○ ○ ◑ ◑ ◑ ◑	To Diagnosis Flow 7 (Faulty wiring between BS units)
◑ ○ ● ● ◑ ◑ ◑	◑ ○ ○ ● ◑ ◑ ◑	To Diagnosis Flow 8 (Faulty wiring between indoor units and BS units)
◑ ○ ● ● ◑ ● ◑	◑ ○ ○ ◑ ◑ ◑ ◑	To Diagnosis Flow 9 (Connection of erroneous models of BS units)
◑ ○ ● ● ◑ ◑ ◑	◑ ○ ○ ◑ ◑ ◑ ◑	To Diagnosis Flow 10 (Faulty connection of BS unit at HP)
◑ ○ ● ◑ ● ● ●	◑ ○ ○ ● ◑ ◑ ◑	To Diagnosis Flow 11 (Faulty connection of outdoor multi at HP/HR)
◑ ○ ● ◑ ● ● ●	◑ ○ ○ ◑ ◑ ◑ ◑	To Diagnosis Flow 12 (Faulty combination of outdoor multi)

Troubleshooting

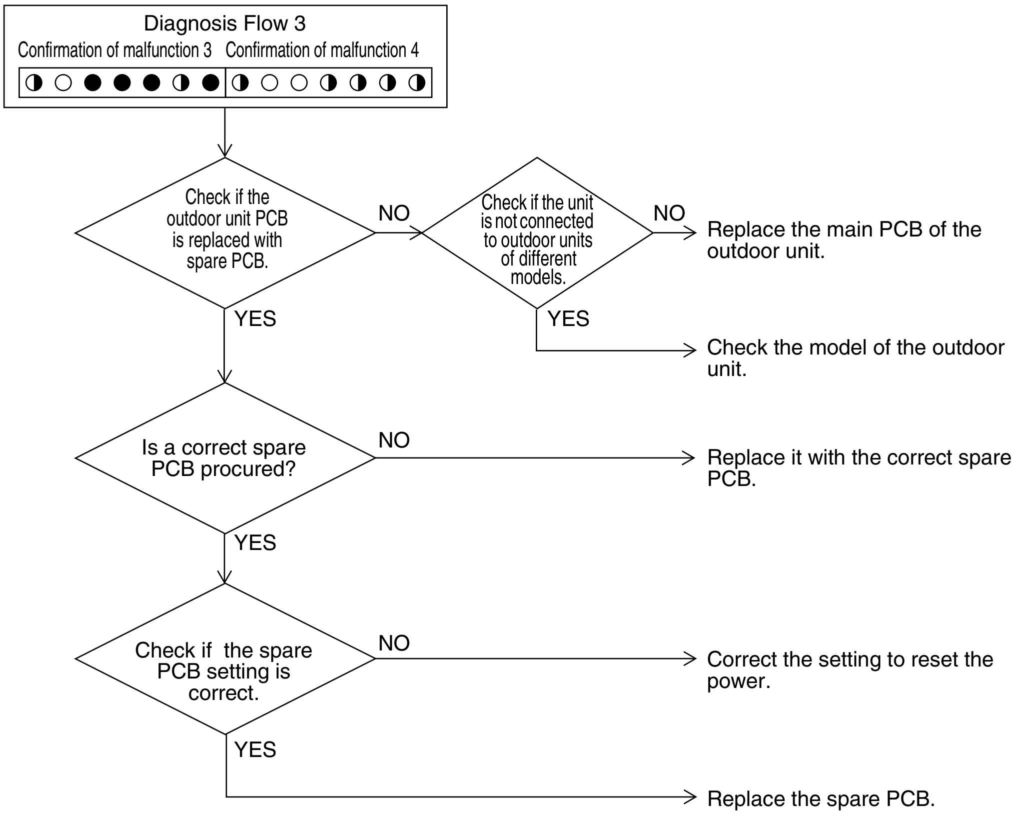
Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

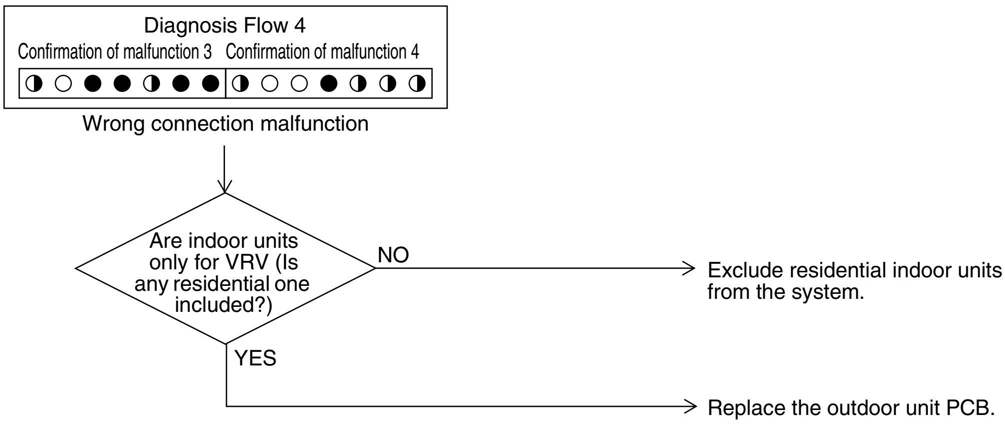




Troubleshooting

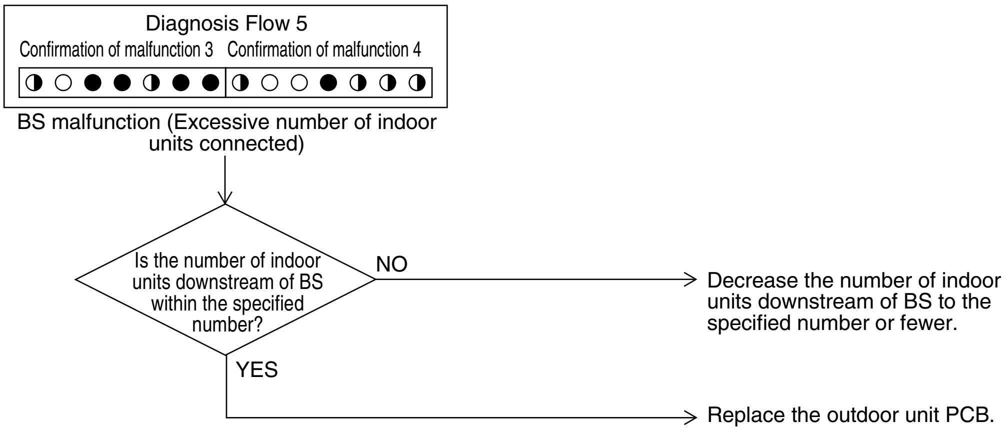
Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

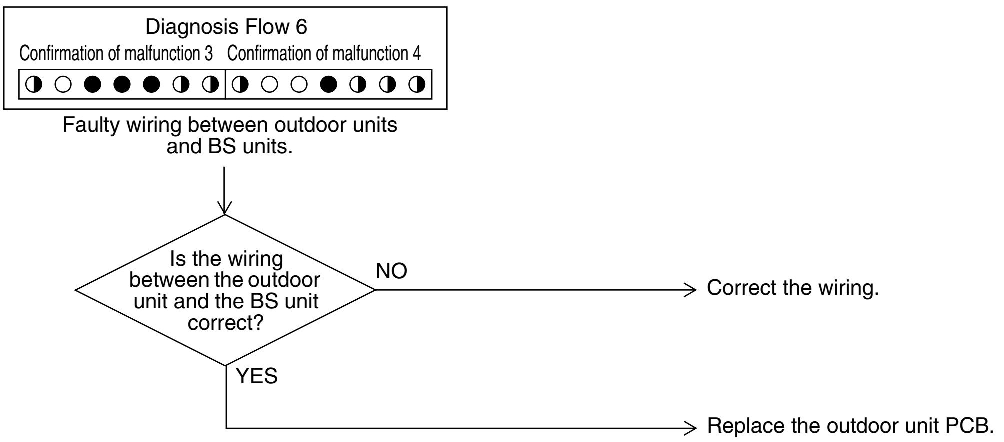




Troubleshooting

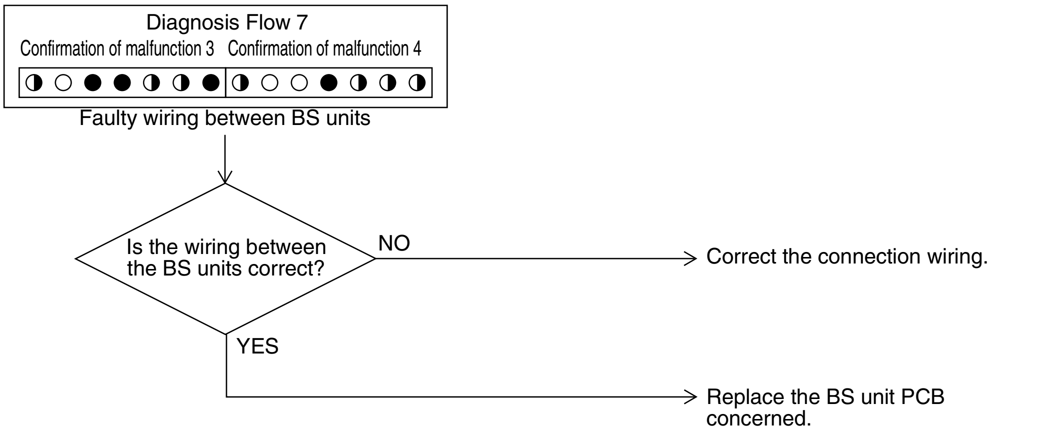
Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

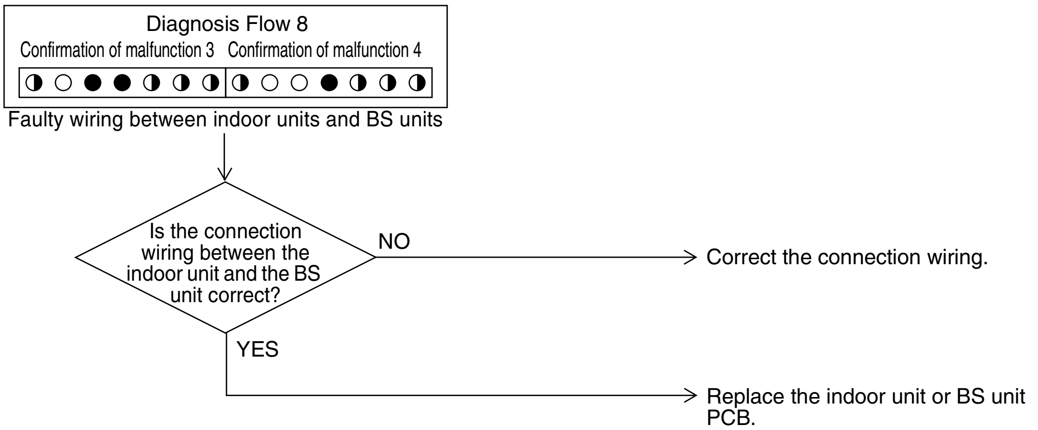


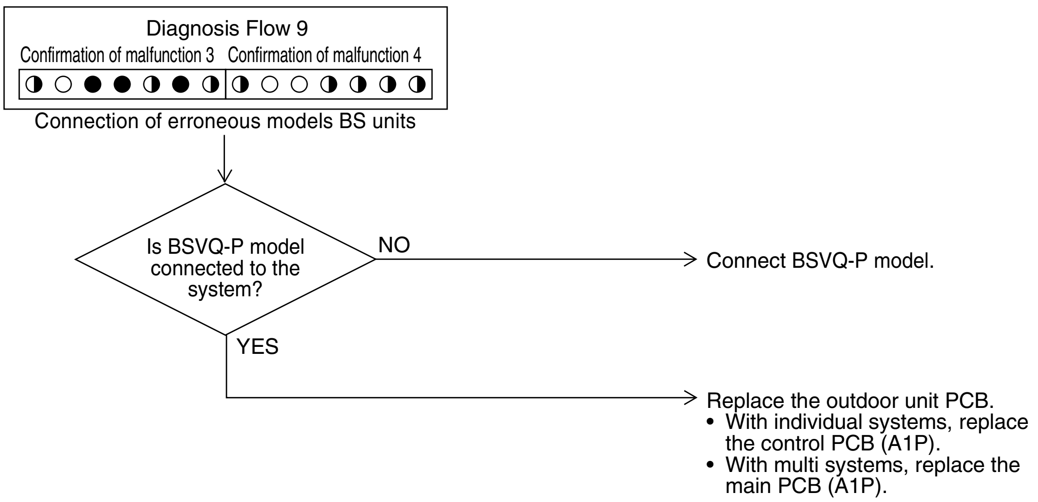


Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

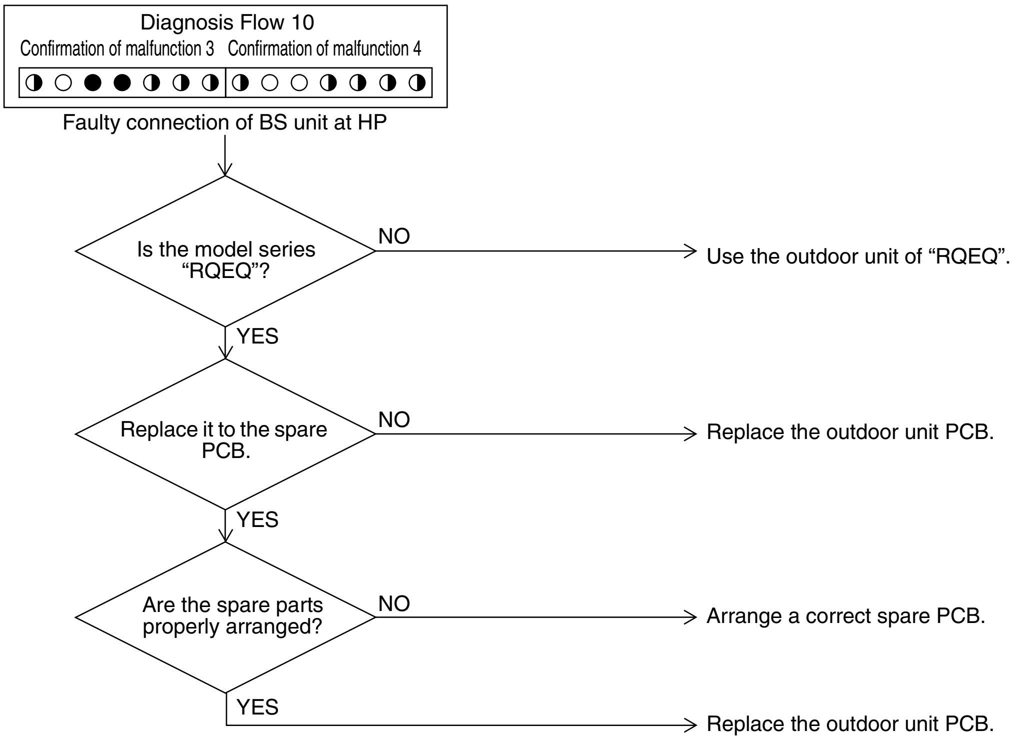


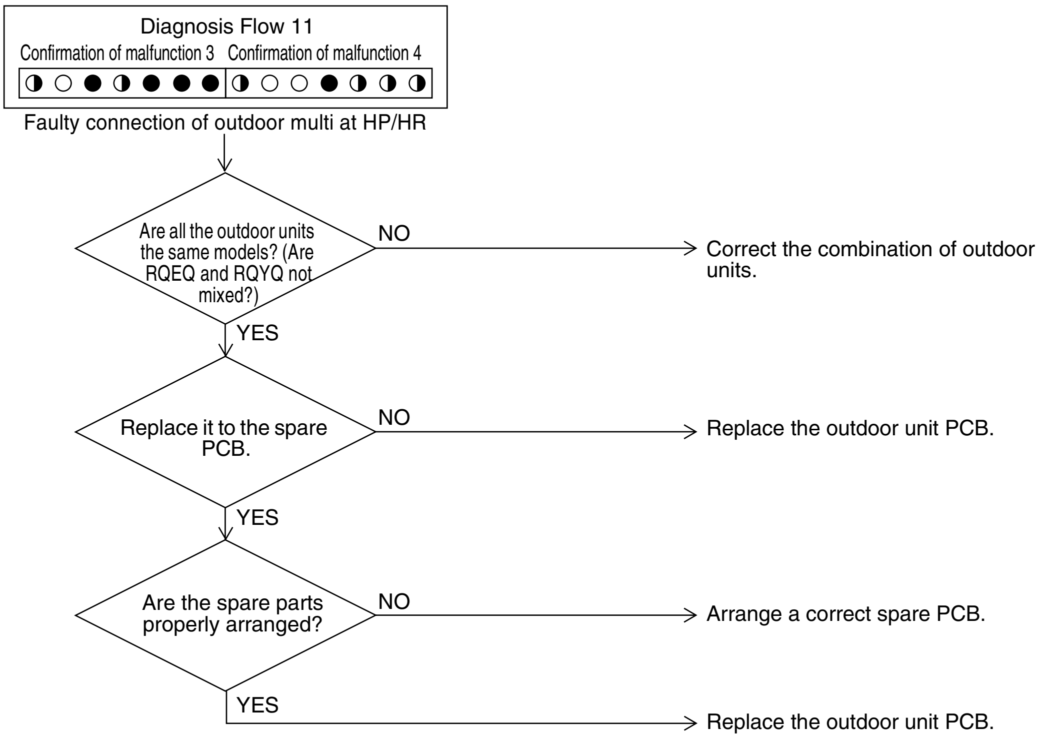




Troubleshooting

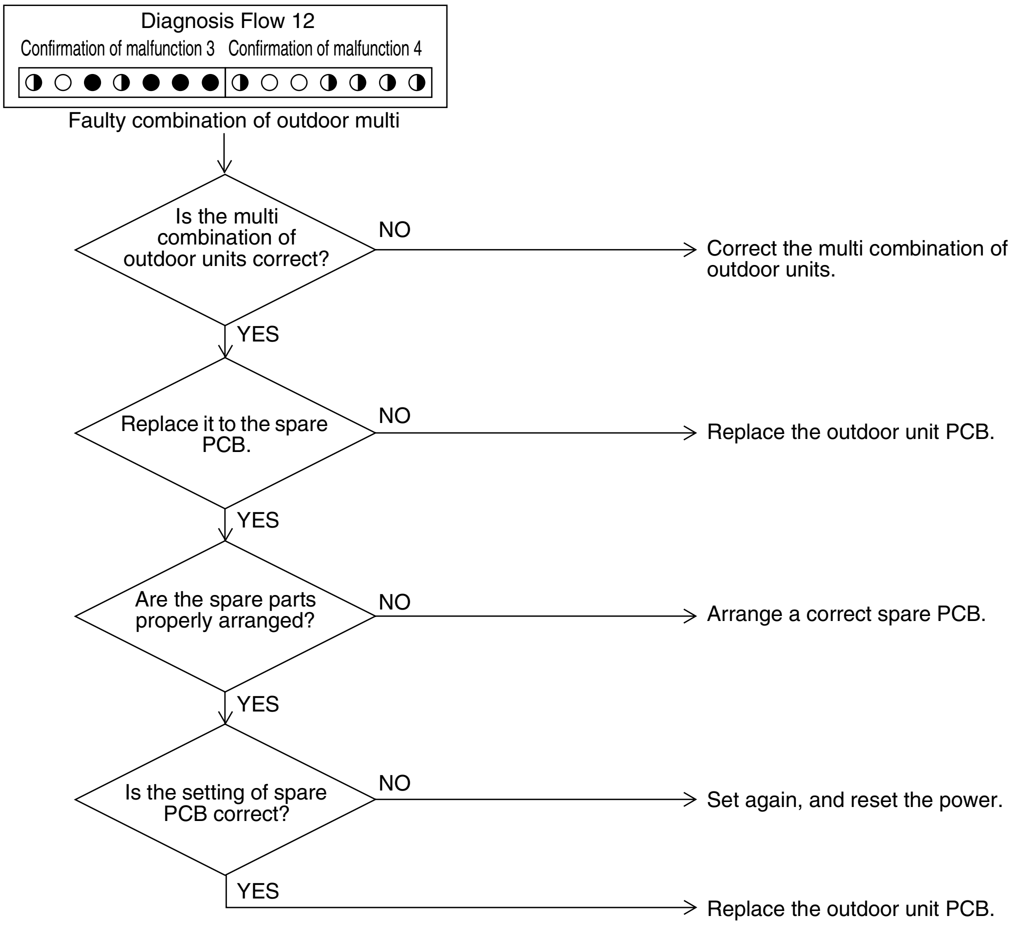
Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.





Troubleshooting

⚠ **Caution** Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



2.38 “UC” Address Duplication of Centralized Controller

Remote Controller Display

UC

Applicable Models

All indoor unit models
Centralized controller

Method of Malfunction Detection

The principal indoor unit detects the same address as that of its own on any other indoor unit.

Malfunction Decision Conditions

The malfunction decision is made as soon as the abnormality aforementioned is detected.

Supposed Causes

- Address duplication of centralized controller
- Defect of outdoor unit PCB

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

The centralized address is duplicated. → Make setting change so that the centralized address will not be duplicated.

2.39 "UE" Malfunction of Transmission between Centralized Controller and Indoor Unit

Remote Controller Display

UE

Applicable Models

All indoor unit models intelligent Touch Controller
Centralized controller
Schedule timer

Method of Malfunction Detection

Micro-computer checks if transmission between indoor unit and centralized controller is normal.

Malfunction Decision Conditions

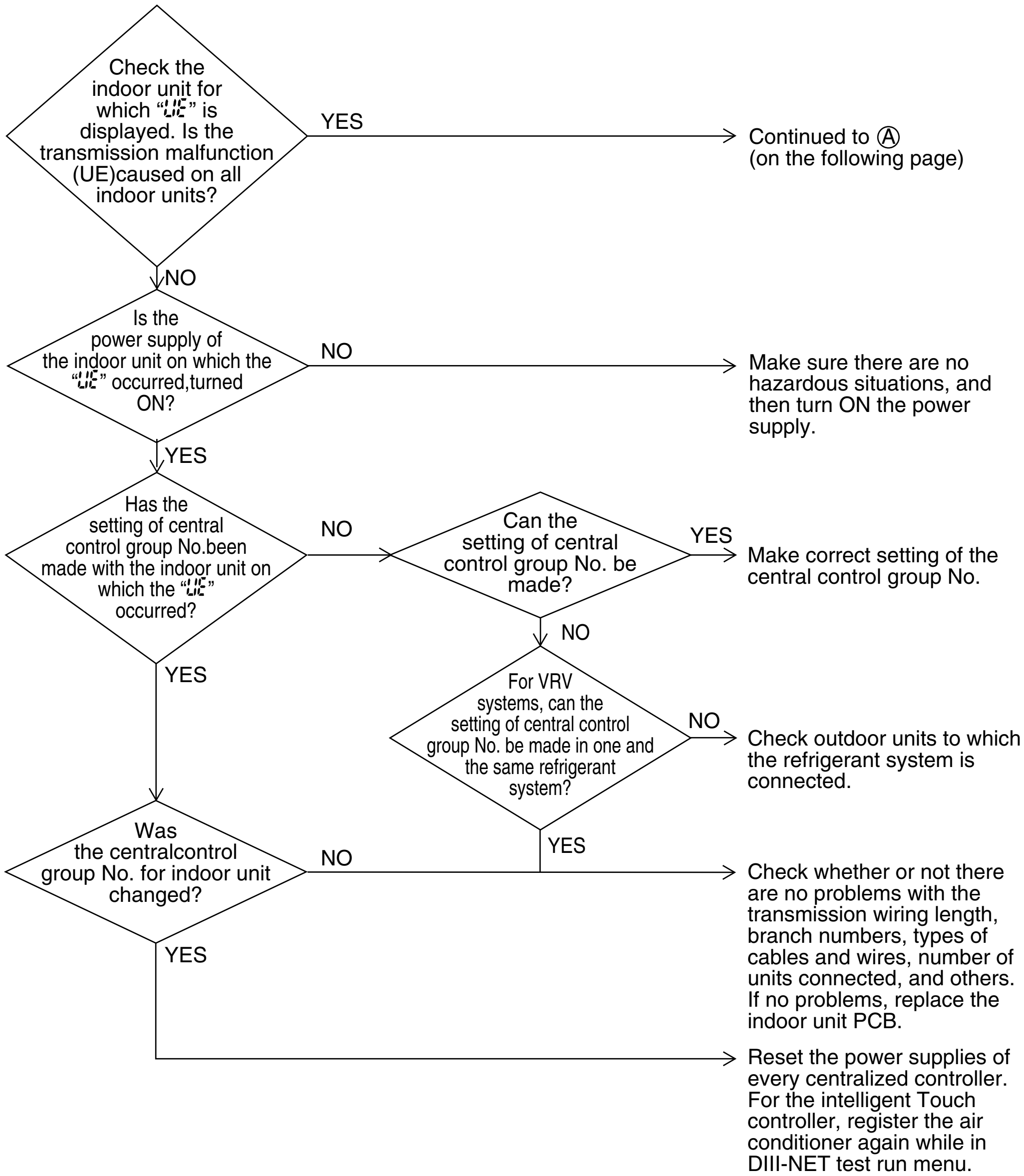
When transmission is not carried out normally for a certain amount of time

Supposed Causes

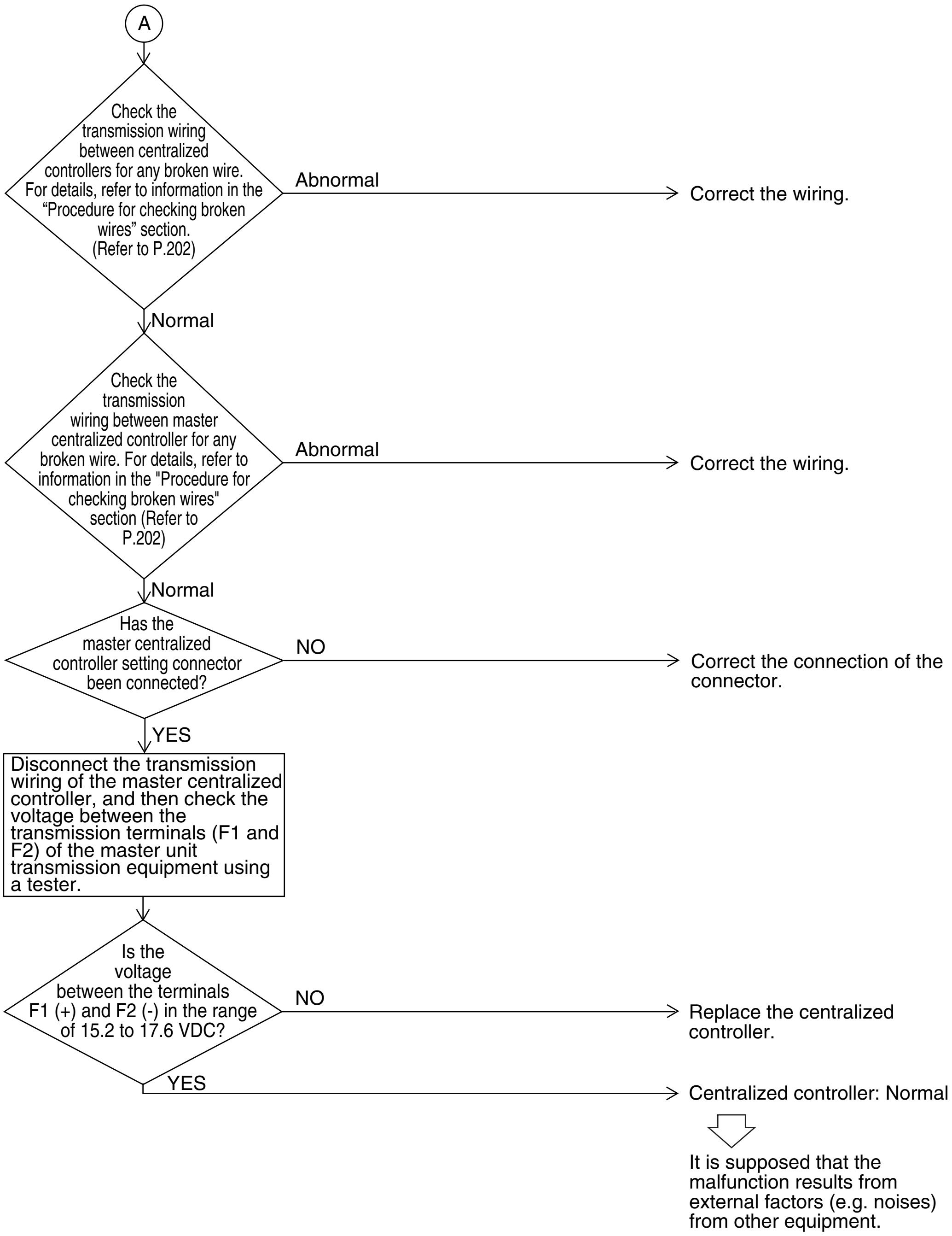
- Malfunction of transmission between optional controllers for centralized control and indoor unit
- Connector for setting master controller is disconnected.
  (or disconnection of connector for independent / combined use changeover switch.)
- Failure of PCB for centralized remote controller
- Defect of indoor unit PCB

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



Troubleshooting



2.40 "UF" System is not Set yet

Remote Controller Display

UF

Applicable Models

All indoor unit models
RQYQ-PY1
RQEQ-PY1

Method of Malfunction Detection

On check operation, the number of indoor units in terms of transmission is not corresponding to that of indoor units that have made changes in temperature.

Malfunction Decision Conditions

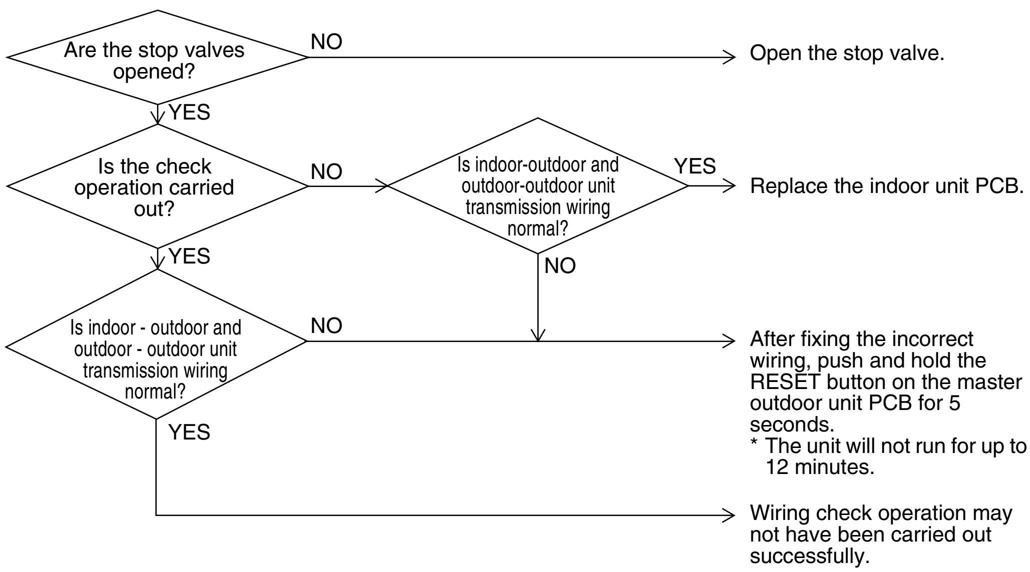
The malfunction is determined as soon as the abnormality aforementioned is detected through checking the system for any erroneous connection of units on the check operation.

Supposed Causes

- Improper connection of transmission wiring between indoor-outdoor units and outdoor-outdoor units
- Failure to execute check operation
- Defect of indoor unit PCB
- Stop valve is left in closed

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

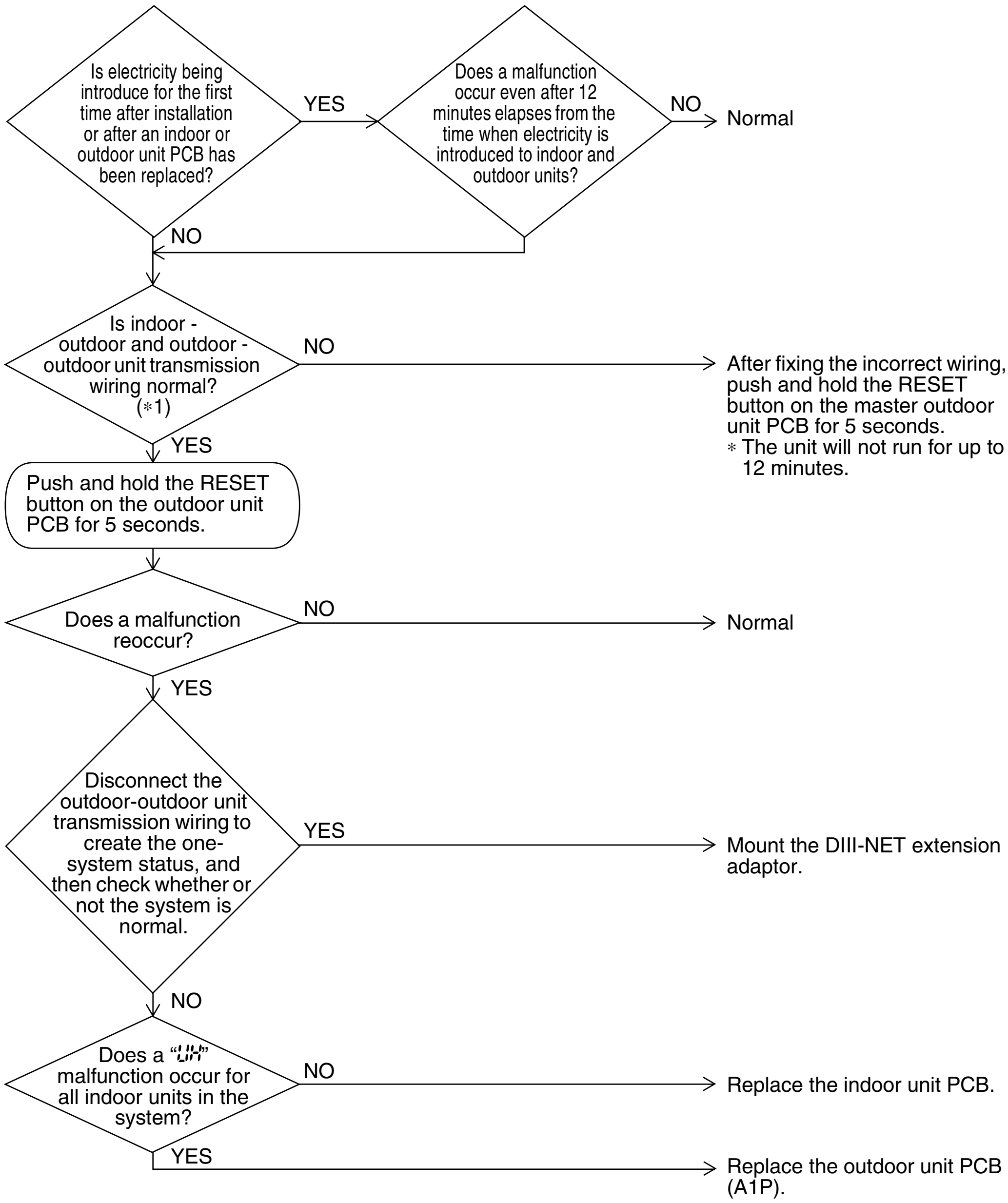


2.41 "UH" Malfunction of System, Refrigerant System Address Undefined

Remote Controller Display	UH
Applicable Models	All indoor unit models RQYQ-PY1 RQEQ-PY1
Method of Malfunction Detection	Detect an indoor unit with no auto address setting.
Malfunction Decision Conditions	The malfunction decision is made as soon as the abnormality aforementioned is detected.
Supposed Causes	■ Improper connection of transmission wiring between indoor-outdoor units and outdoor-outdoor units ■ Defect of indoor unit PCB ■ Defect of outdoor unit main PCB (A1P)

Troubleshooting

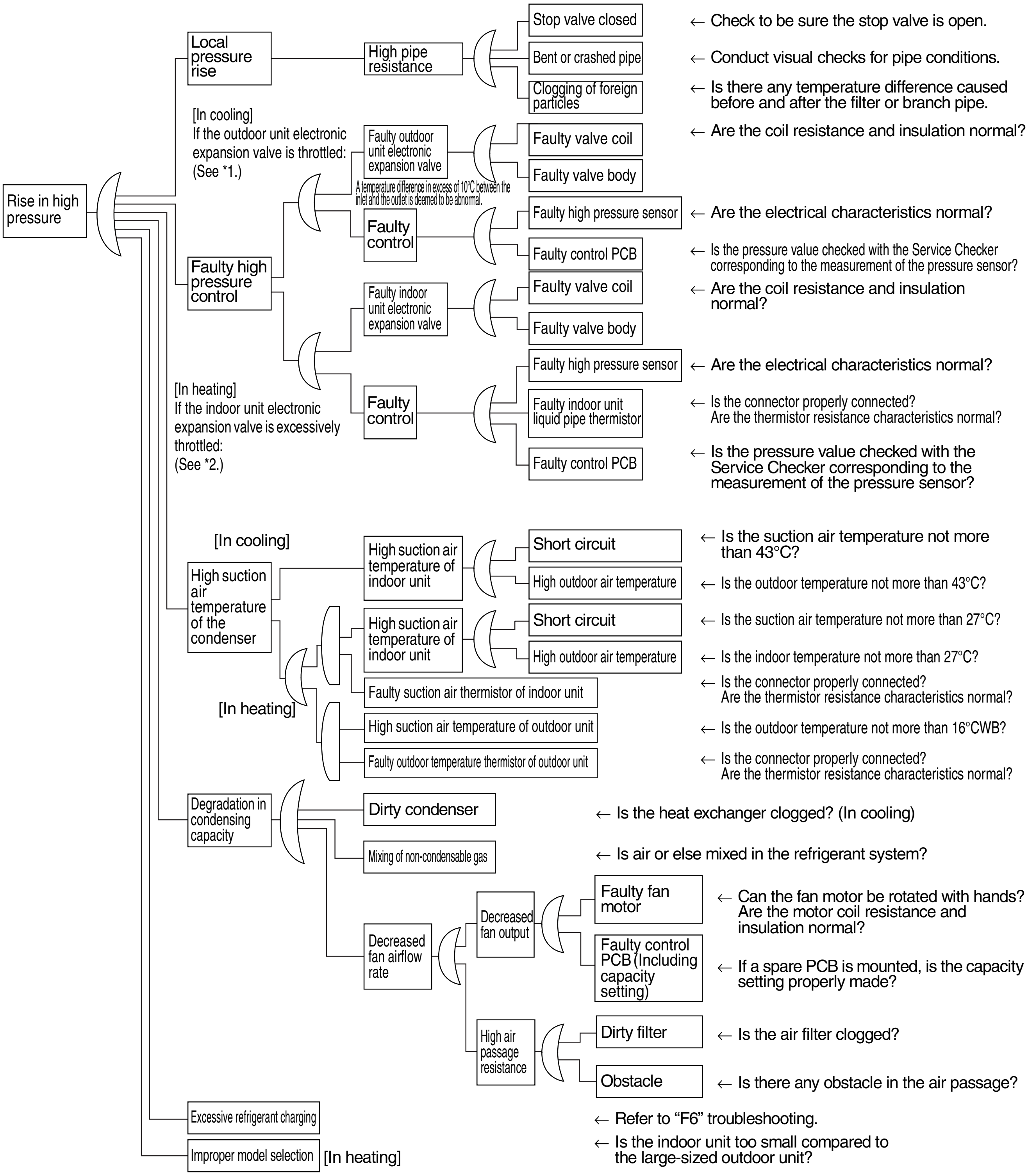
⚠ **Caution** Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



∗1: Check the correct wiring "indoor-outdoor" and "outdoor-outdoor" by Installation Manual.
∗2: What is Auto Address?
This is the address automatically assigned to indoor units and outdoor units after initial power supply upon installation, or after executing rewiring (Keep pressing the RESET button for more than 4 seconds).

CHECK 1 Check for causes of rise in high pressure

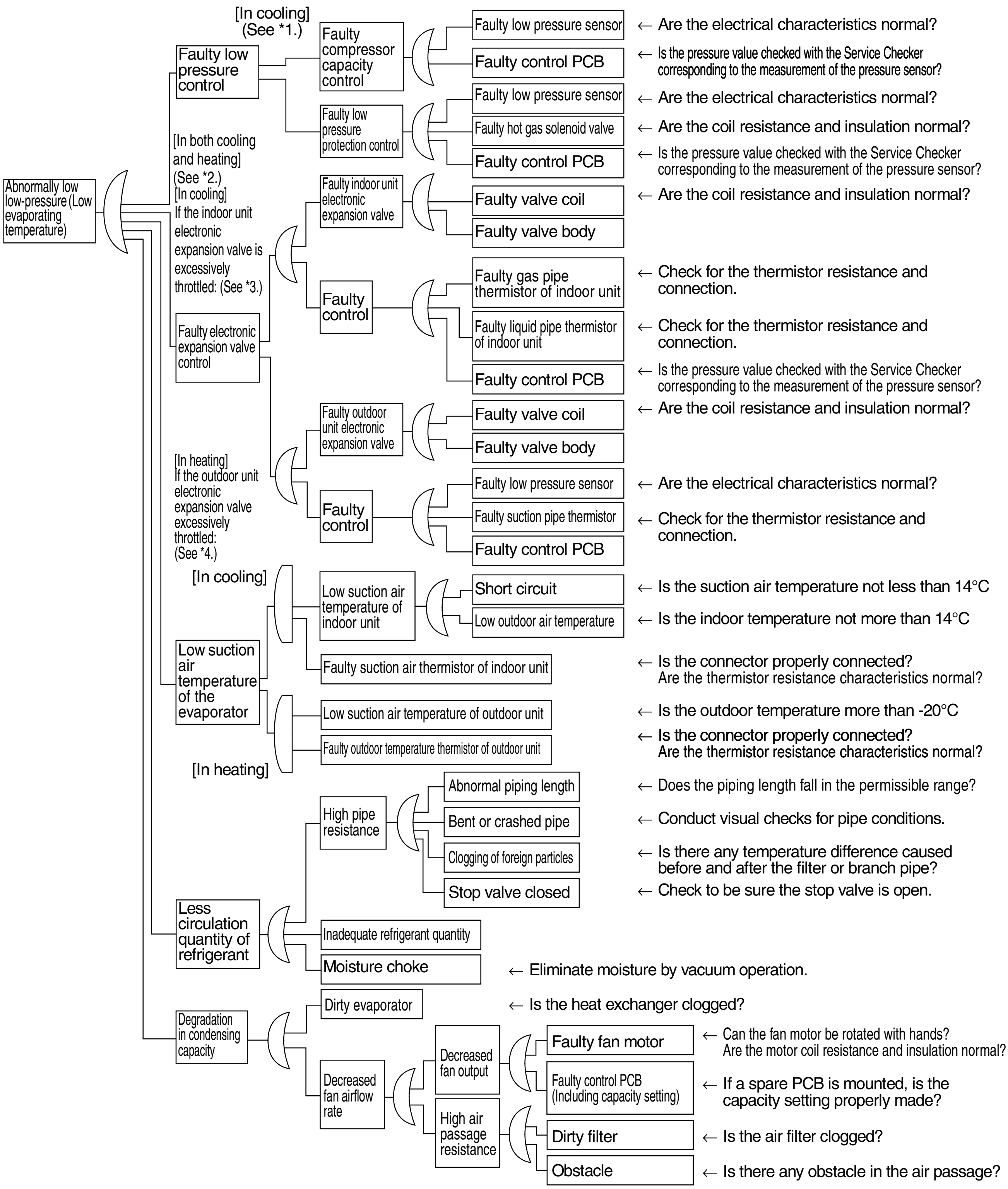
Referring to the Fault Tree Analysis (FTA) shown below, probe the faulty points.



*1: In cooling, it is normal if the outdoor unit electronic expansion valve (EVM) is fully open.
*2: In heating, the indoor unit electronic expansion valve is used for "subcooled degree control".
(For details, refer to "Electronic Expansion Valve Control".)

CHECK 2 Check for causes of drop in low pressure

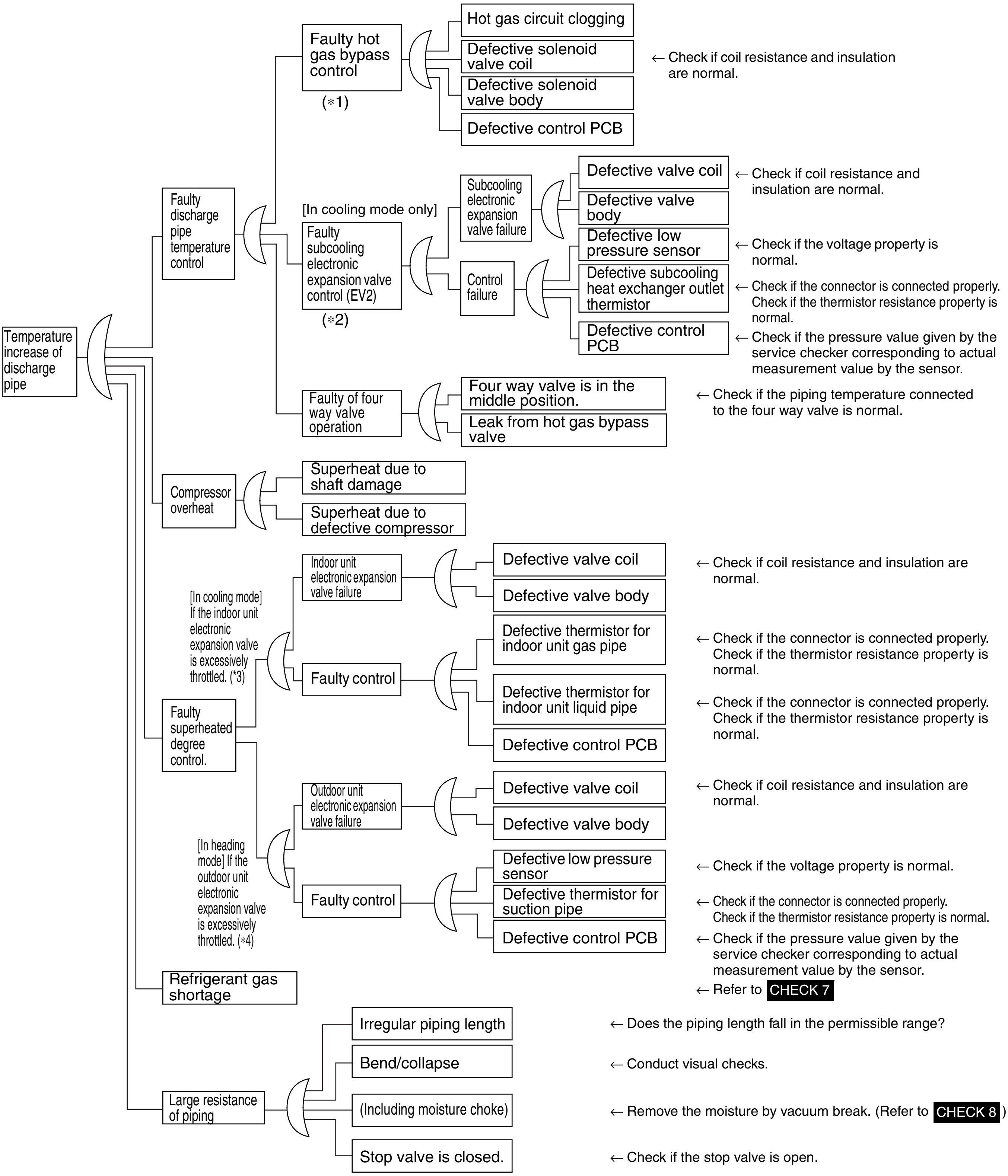
Referring to the Fault Tree Analysis (FTA) shown below, probe the faulty points.



*1: For details of the compressor capacity control while in cooling, refer to “Compressor PI Control”.
*2: The “low pressure protection control” includes low pressure protection control and hot gas bypass control.
*3: In cooling, the indoor unit electronic expansion valve is used for “superheated degree control”.
*4: In heating, the outdoor unit electronic expansion valve (EVM) is used for “superheated degree control of outdoor unit heat exchanger”.

CHECK 3 Check the Factors of Overheat Operation

Identify the defective points referring to the failure factor analysis (FTA) as follows.



∗1: Refer to “Low pressure protection control” for hot gas bypass control.
∗2: Refer to “Subcooling electronic expansion valve control”.
∗3: “Superheating temperature control” in cooling mode is conducted by indoor unit electronic expansion valve.
∗4: Superheating temperature control in heating mode is conducted by outdoor unit electronic expansion valve (EVM).
∗5: Judgement criteria of superheat operation:
(1) Suction gas superheating temperature: 10 degrees and over. (2) Discharge gas superheating temperature: 45 degrees and over, except for immediately after starting and drooping control, etc..
(Use the above stated values as a guide. Depending on the other conditions, the unit may be normal despite the values within the above scope.)

CHECK 4 Power Transistor Check

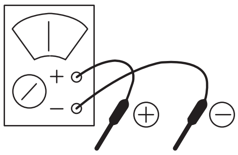
Perform the following procedures prior to check.

(1) Power Off.

(2) Remove all the wiring connected to the PCB where power transistors are mounted on.

[Preparation]

· Tester



∗ Preparing a tester in the analog system is recommended. A tester in the digital system with diode check function will be usable.

[Point of Measurement and Judgement Criteria]

· Measure the resistance value using a tester at each point of measurement below, 10 minutes later after power OFF.

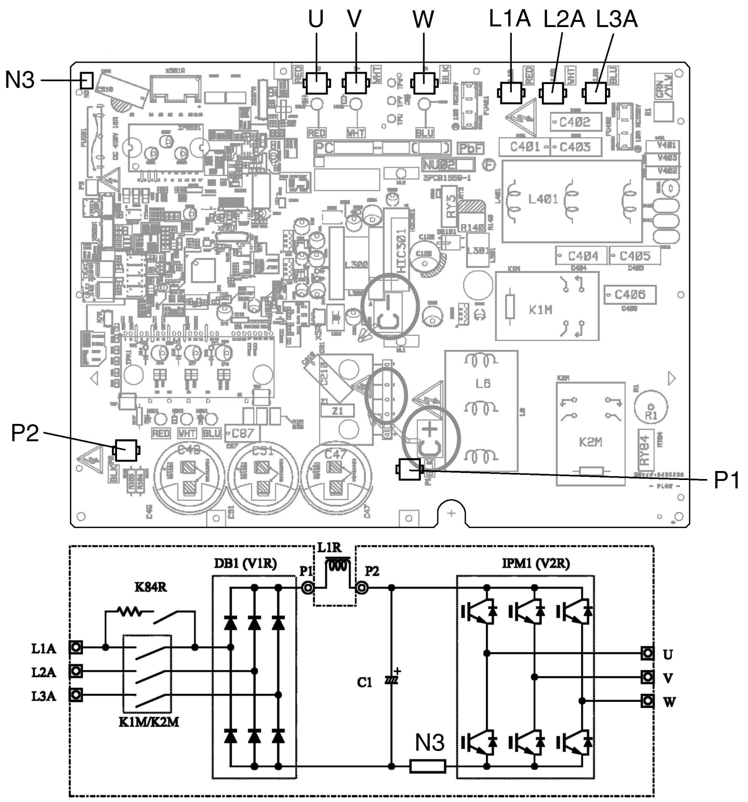
To use analog tester:
Measurement in the resistance value mode in the range of multiplying 1kΩ.

No.	Point of Measurement +	Point of Measurement −	Judgement Criteria	Remarks
1	P2	U	2 ~ 15kΩ	
2	P2	V		
3	P2	W		
4	U	P2	15kΩ and above (including ∞)	Due to condenser charge and so on, resistance measurement may require some time.
5	V	P2		
6	W	P2		
7	N3	U		
8	N3	V		
9	N3	W		
10	U	N3	2 ~ 15kΩ	
11	V	N3		
12	W	N3		

To use digital tester:
Measurement is executed in the diode check mode. (—▶|—)

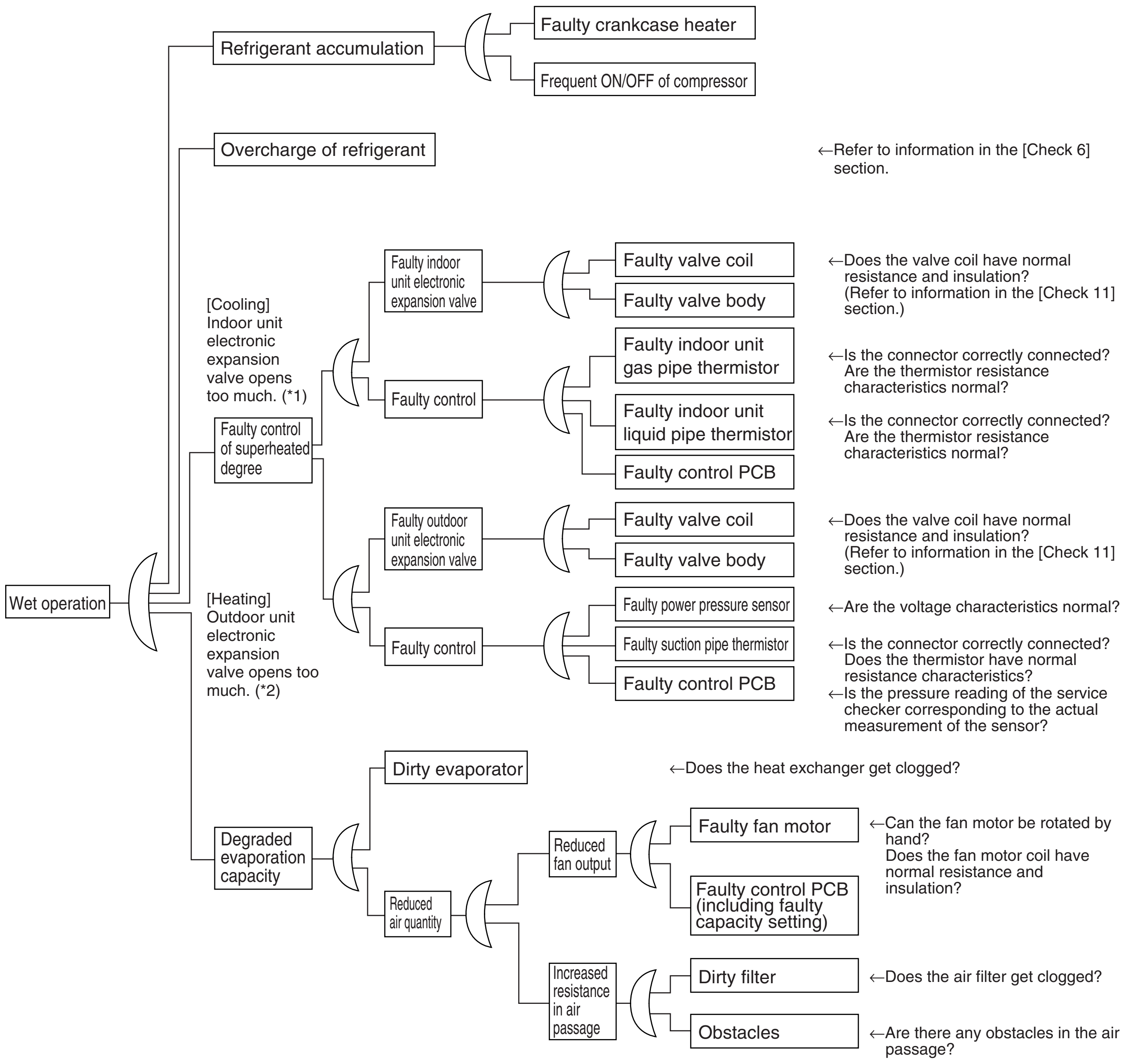
No.	Point of Measurement +	Point of Measurement −	Judgement Criteria	Remarks
1	P2	U	1.2V and over	Due to condenser charge and so on, resistance measurement may require some time.
2	P2	V		
3	P2	W		
4	U	P2	0.3 ~ 0.7V	
5	V	P2		
6	W	P2		
7	N3	U		
8	N3	V		
9	N3	W		
10	U	N3	1.2V and over	Due to condenser charge and so on, resistance measurement may require some time.
11	V	N3		
12	W	N3		

[PCB and Circuit Diagram]



CHECK 5 Check for causes of wet operation.

Referring to the Fault Tree Analysis (FTA) shown below, identify faulty points.



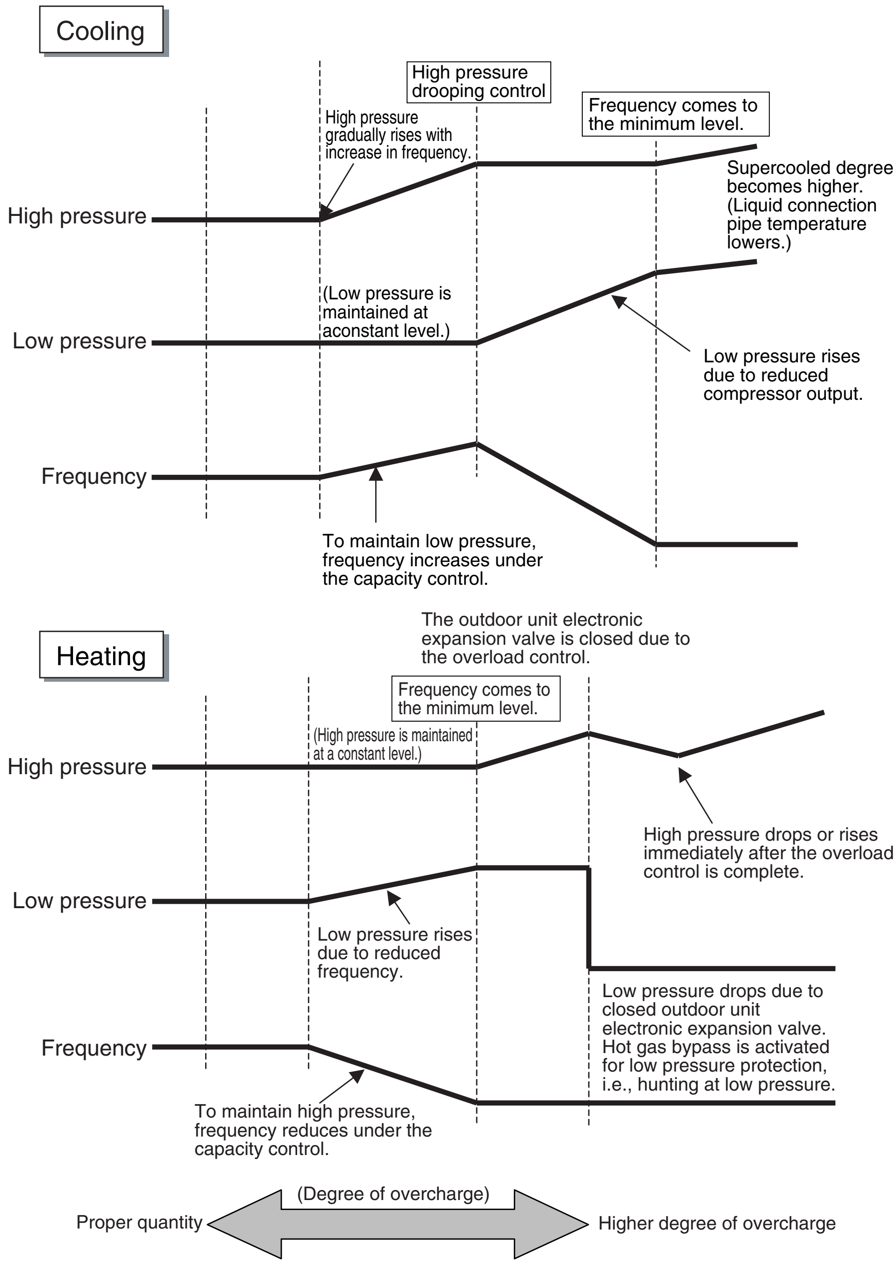
*1: "Superheated degree control" in cooling operation is exercised with the indoor unit electronic expansion valve.
*2: "Superheated degree control" in heating operation is exercised with the outdoor unit electronic expansion valve (EV1).
*3: Guideline of superheated degree to judge as wet operation
①Suction gas superheated degree: Not more than 3°C; ②Discharge gas superheated degree: Not more than 15°C, except immediately after compressor starts up or is running under drooping control.
(Use the values shown above as a guideline. Even if the superheated degree falls in the range, the compressor may be normal depending on other conditions.)

CHECK 6 **Check for overcharge of refrigerant.**

In case of VRV Systems, the only way to judge as the overcharge of refrigerant is with operating conditions due to the relationship to pressure control and electronic expansion valve control.
As information for making a judgement, refer to information provided below.

<u>Diagnosis of overcharge of refrigerant</u>

1. High pressure rises. Consequently, overload control is exercised to cause scant cooling capacity.
2. The superheated degree of suction gas lowers (or the wet operation is performed). Consequently, the compressor becomes lower in discharge pipe temperature despite of pressure loads.
3. The supercooled degree of condensate rises. Consequently, in heating operation, the temperature of outlet air passing through the supercooled section becomes lower.

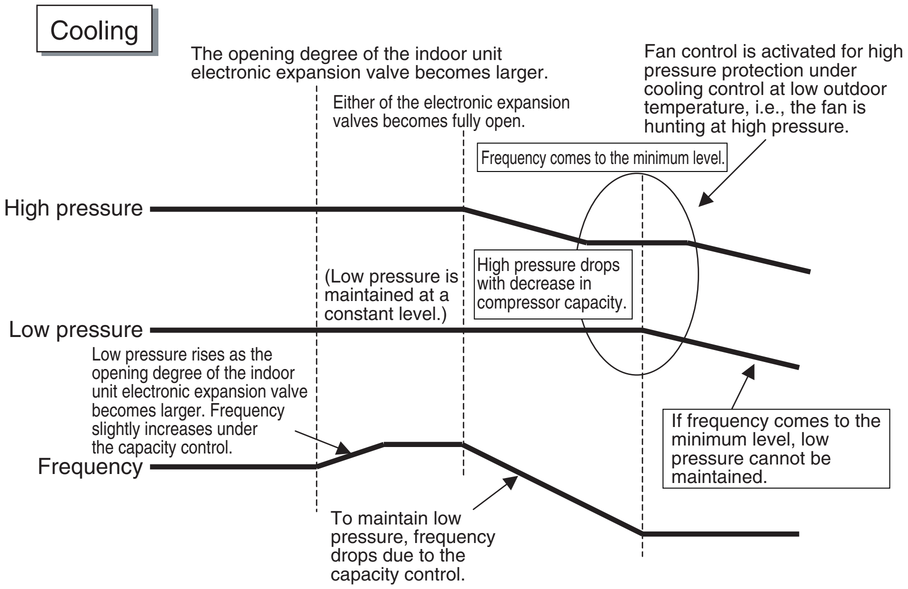


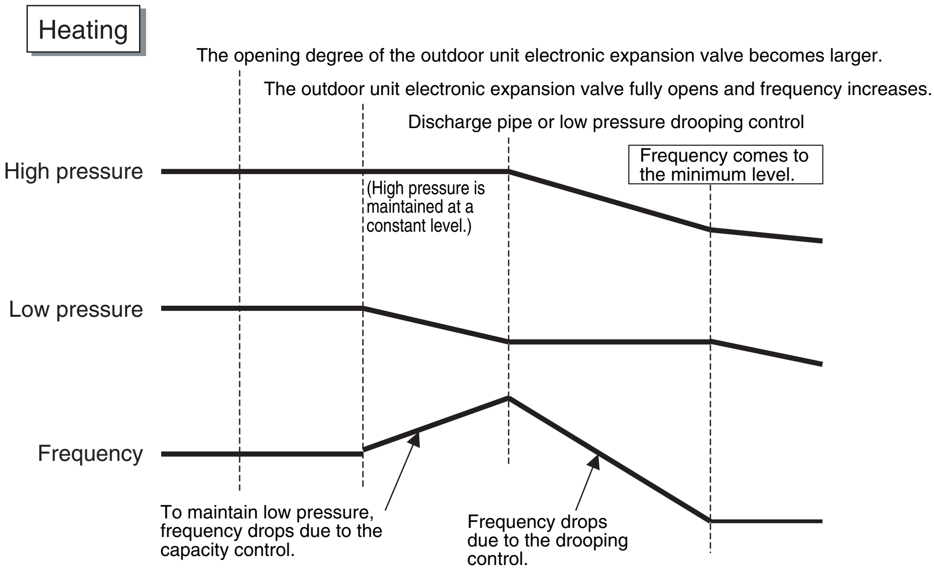
CHECK 7 **Check for shortage of refrigerant.**

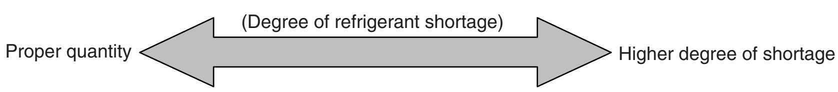
In case of VRV Systems, the only way to judge as the shortage of refrigerant is with operating conditions due to the relationship to pressure control and electronic expansion valve control.
As information for making a judgement, refer to information provided below.

<u>Diagnosis of shortage of refrigerant</u>

1. The superheated degree of suction gas rises. Consequently, the compressor discharge gas temperature becomes higher.
2. The superheated degree of suction gas rises. Consequently, the electronic expansion valve turns open.
3. Low pressure drops to cause the unit not to demonstrate cooling capacity (heating capacity).







CHECK 8 **Vacuuming and dehydration procedure**

Conduct vacuuming and dehydration in the piping system following the procedure for <Normal vacuuming and dehydration> described below.
Furthermore, if moisture may get mixed in the piping system, follow the procedure for <Special vacuuming and dehydration> described below.

<Normal vacuuming and dehydration>

① Vacuuming and dehydration
- Use a vacuum pump that enables vacuuming up to 100.7kPa (5 torr, -755 mmHg).
- Connect manifold gauges to the service ports of liquid pipe and gas pipe and run the vacuum pump for a period of two or more hours to conduct evacuation to -100.7kPa or less.
- If the degree of vacuum does not reach -100.7kPa or less even though evacuation is conducted for a period of two hours, moisture will have entered the system or refrigerant leakage will have been caused. In this case, conduct evacuation for a period of another one hour.
- If the degree of vacuum does not reach -100.7kPa or less even though evacuation is conducted for a period of three hours, conduct leak tests.

② Leaving in vacuum state
- Leave the compressor at the degree of vacuum of -100.7kPa or less for a period of one hour or more, and then check to be sure that the vacuum gauge reading does not rise. (If the reading rises, moisture may have remained in the system or refrigerant leakage may have been caused.)

③ Refrigerant charge
- Purge air from the manifold gauge connection hoses, and then charge a necessary quantity of refrigerant.

<Special vacuuming and dehydration> - In case moisture may get mixed in the piping*

① Vacuuming and dehydration
- Follow the same procedure as that for 1) Normal vacuuming and dehydration described above.

② Vacuum break
- Pressurize with nitrogen gas up to 0.05MPa.

③ Vacuuming and dehydration
- Conduct vacuuming and dehydration for a period of one hour or more. If the degree of vacuum does not reach -100.7kPa or less even though evacuation is conducted for a period of two hours or more, repeat vacuum break - vacuuming and dehydration.

④ Leaving in vacuum state
- Leave the compressor at the degree of vacuum of -100.7kPa or less for a period of one hour or more, and then check to be sure that the vacuum gauge reading does not rise.

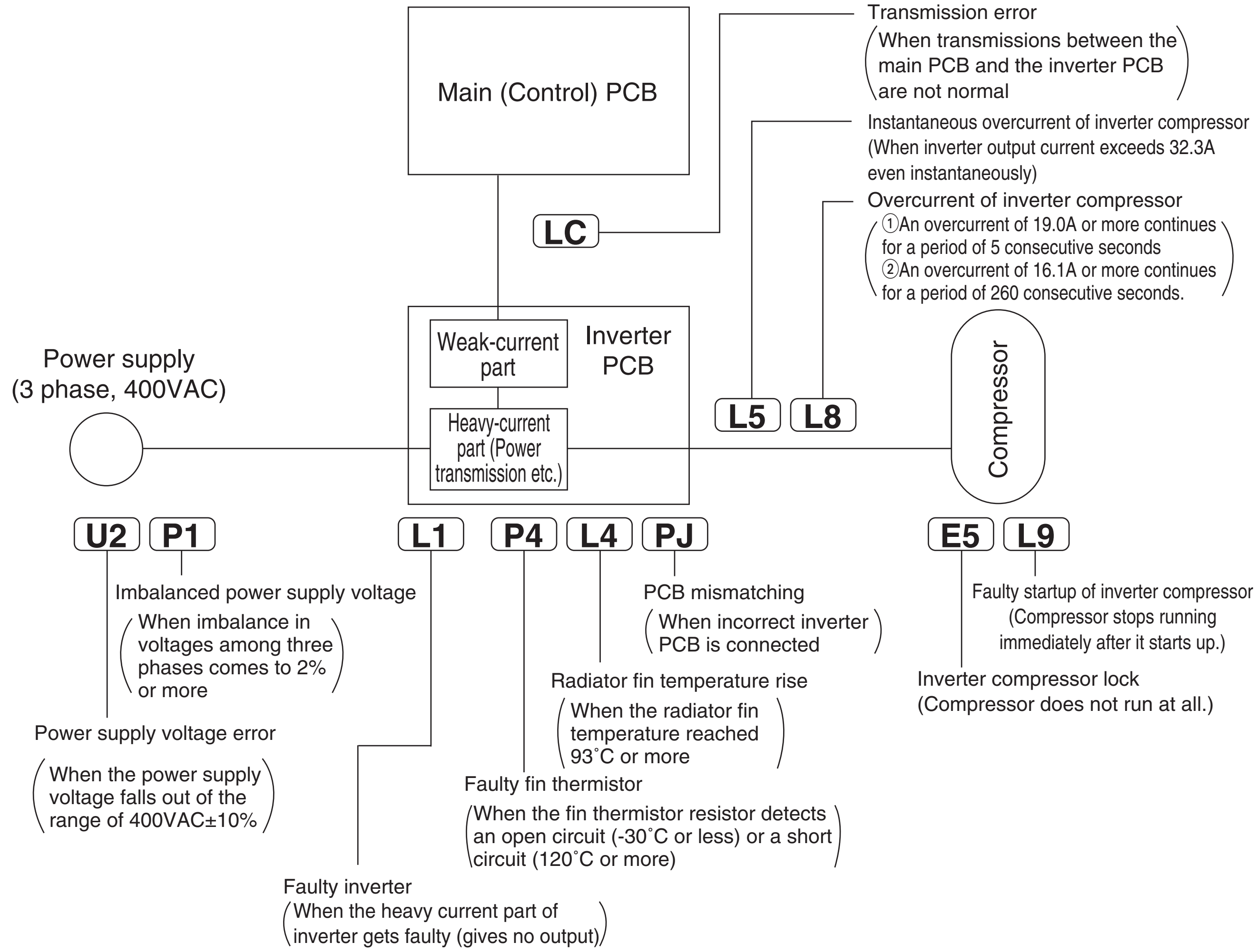
⑤ Refrigerant charge
- Purge air from the manifold gauge connection hoses, and then charge a necessary quantity of refrigerant.

* In case of construction during rainy reason, if dew condensation occurs in the piping due to extended construction period, or rainwater or else may enter the piping during construction work:

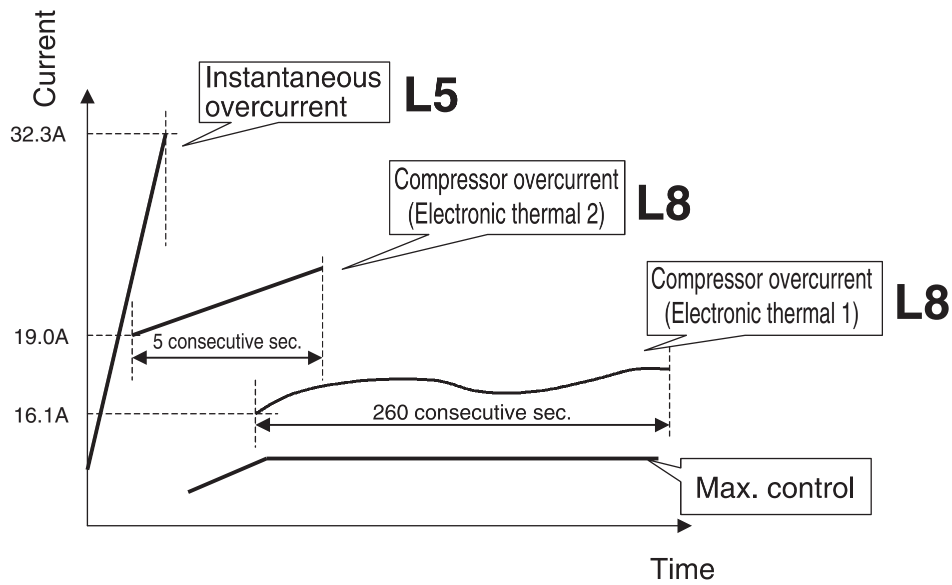
CHECK 9 List of inverter-related malfunction codes

	Code	Name	Condition for determining malfunction	Major cause
Compressor current	L5	Instantaneous overcurrent of inverter compressor	• Inverter output current exceeds 32.3A even instantaneously.	• Liquid sealing • Faulty compressor • Faulty inverter PCB
	L8	Overcurrent of inverter compressor (Electronic thermal)	• Compressor overload running An overcurrent of 19.0A or more continues for a period of 5 consecutive seconds or that of 16.1A or more continues for a period of 260 consecutive seconds. • The inverter loses synchronization.	• Backflow of compressor liquid • Sudden changes in loads • Disconnected compressor wiring • Faulty inverter PCB
Protection device and others	L1	Faulty inverter PCB	• No output is given.	• Faulty heavy current part of compressor
	L9	Faulty startup of inverter compressor	• The compressor motor fails to start up.	• Liquid sealing or faulty compressor • Excessive oil or refrigerant • Faulty inverter PCB
	E5	Inverter compressor lock	• The compressor is in the locked status (does not rotate).	• Faulty compressor
	L4	Radiator fin temperature rise	• The radiator fin temperature reaches 87°C or more (while in operation).	• Malfunction of fan • Running in overload for an extended period of time • Faulty inverter PCB
	U2	Power supply voltage error	• The inverter power supply voltage is high or low.	• Power supply error • Faulty inverter PCB
	P1	Imbalanced power supply	• Power supply voltages get significantly imbalanced among three phases.	• Power supply error (imbalanced voltages of 2% or more) • Faulty inverter PCB • Dead inverter PCB
	LC	Transmission error (between inverter PCB and control PCB)	• With the outdoor unit PCB, no communications are carried out across control PCB - inverter PCB - fan PCB.	• Broken wire in communication line • Faulty control PCB • Faulty inverter PCB • Faulty fan PCB
	PJ	PCB mismatching	• Any PCB of specification different from that of the product is connected.	• PCB of different specification mounted
	P4	Faulty fin thermistor	• The fin thermistor gets short-circuited or open.	• Faulty fin thermistor

CHECK 10 Concept of inverter-related malfunction codes



Malfunction codes related to compressor current



CHECK 11 Thermistor Resistance / Temperature Characteristics

Indoor unit	For suction air	R1T
	For liquid pipe	R2T
	For gas pipe	R3T
Outdoor unit	For outdoor air	R1T
	For coil	R2T
	For suction pipe	R4T
	For Receiver gas pipe	R5T
	For Receiver outlet liquid pipe	R6T

Outdoor unit for fin thermistor R1T

T°C	kΩ
-10	-
-8	-
-6	88.0
-4	79.1
-2	71.1
0	64.1
2	57.8
4	52.3
6	47.3
8	42.9
10	38.9
12	35.3
14	32.1
16	29.2
18	26.6
20	24.3
22	22.2
24	20.3
26	18.5
28	17.0
30	15.6
32	14.2
34	13.1
36	12.0
38	11.1
40	10.3
42	9.5
44	8.8
46	8.2
48	7.6
50	7.0
52	6.7
54	6.0
56	5.5
58	5.2
60	4.79
62	4.46
64	4.15
66	3.87
68	3.61
70	3.37
72	3.15
74	2.94
76	2.75
78	2.51
80	2.41
82	2.26
84	2.12
86	1.99
88	1.87
90	1.76
92	1.65
94	1.55
96	1.46
98	1.38

T°C	kΩ	T°C	kΩ	T°C	kΩ	T°C	kΩ
-20	197.81	-19.5	192.08	30	16.10	30.5	15.76
-19	186.53	-18.5	181.16	31	15.43	31.5	15.10
-18	175.97	-17.5	170.94	32	14.79	32.5	14.48
-17	166.07	-16.5	161.36	33	14.18	33.5	13.88
-16	156.80	-15.5	152.38	34	13.59	34.5	13.31
-15	148.10	-14.5	143.96	35	13.04	35.5	12.77
-14	139.94	-13.5	136.05	36	12.51	36.5	12.25
-13	132.28	-12.5	128.63	37	12.01	37.5	11.76
-12	125.09	-11.5	121.66	38	11.52	38.5	11.29
-11	118.34	-10.5	115.12	39	11.06	39.5	10.84
-10	111.99	-9.5	108.96	40	10.63	40.5	10.41
-9	106.03	-8.5	103.18	41	10.21	41.5	10.00
-8	100.41	-7.5	97.73	42	9.81	42.5	9.61
-7	95.14	-6.5	92.61	43	9.42	43.5	9.24
-6	90.17	-5.5	87.79	44	9.06	44.5	8.88
-5	85.49	-4.5	83.25	45	8.71	45.5	8.54
-4	81.08	-3.5	78.97	46	8.37	46.5	8.21
-3	76.93	-2.5	74.94	47	8.05	47.5	7.90
-2	73.01	-1.5	71.14	48	7.75	48.5	7.60
-1	69.32	-0.5	67.56	49	7.46	49.5	7.31
0	65.84	0.5	64.17	50	7.18	50.5	7.04
1	62.54	1.5	60.96	51	6.91	51.5	6.78
2	59.43	2.5	57.94	52	6.65	52.5	6.53
3	56.49	3.5	55.08	53	6.41	53.5	6.53
4	53.71	4.5	52.38	54	6.65	54.5	6.53
5	51.09	5.5	49.83	55	6.41	55.5	6.53
6	48.61	6.5	47.42	56	6.18	56.5	6.06
7	46.26	7.5	45.14	57	5.95	57.5	5.84
8	44.05	8.5	42.98	58	5.74	58.5	5.43
9	41.95	9.5	40.94	59	5.14	59.5	5.05
10	39.96	10.5	39.01	60	4.96	60.5	4.87
11	38.08	11.5	37.18	61	4.79	61.5	4.70
12	36.30	12.5	35.45	62	4.62	62.5	4.54
13	34.62	13.5	33.81	63	4.46	63.5	4.38
14	33.02	14.5	32.25	64	4.30	64.5	4.23
15	31.50	15.5	30.77	65	4.16	65.5	4.08
16	30.06	16.5	29.37	66	4.01	66.5	3.94
17	28.70	17.5	28.05	67	3.88	67.5	3.81
18	27.41	18.5	26.78	68	3.75	68.5	3.68
19	26.18	19.5	25.59	69	3.62	69.5	3.56
20	25.01	20.5	24.45	70	3.50	70.5	3.44
21	23.91	21.5	23.37	71	3.38	71.5	3.32
22	22.85	22.5	22.35	72	3.27	72.5	3.21
23	21.85	23.5	21.37	73	3.16	73.5	3.11
24	20.90	24.5	20.45	74	3.06	74.5	3.01
25	20.00	25.5	19.56	75	2.96	75.5	2.91
26	19.14	26.5	18.73	76	2.86	76.5	2.82
27	18.32	27.5	17.93	77	2.77	77.5	2.72
28	17.54	28.5	17.17	78	2.68	78.5	2.64
29	16.80	29.5	16.45	79	2.60	79.5	2.55
30	16.10	30.5	15.76	80	2.51	80.5	2.47

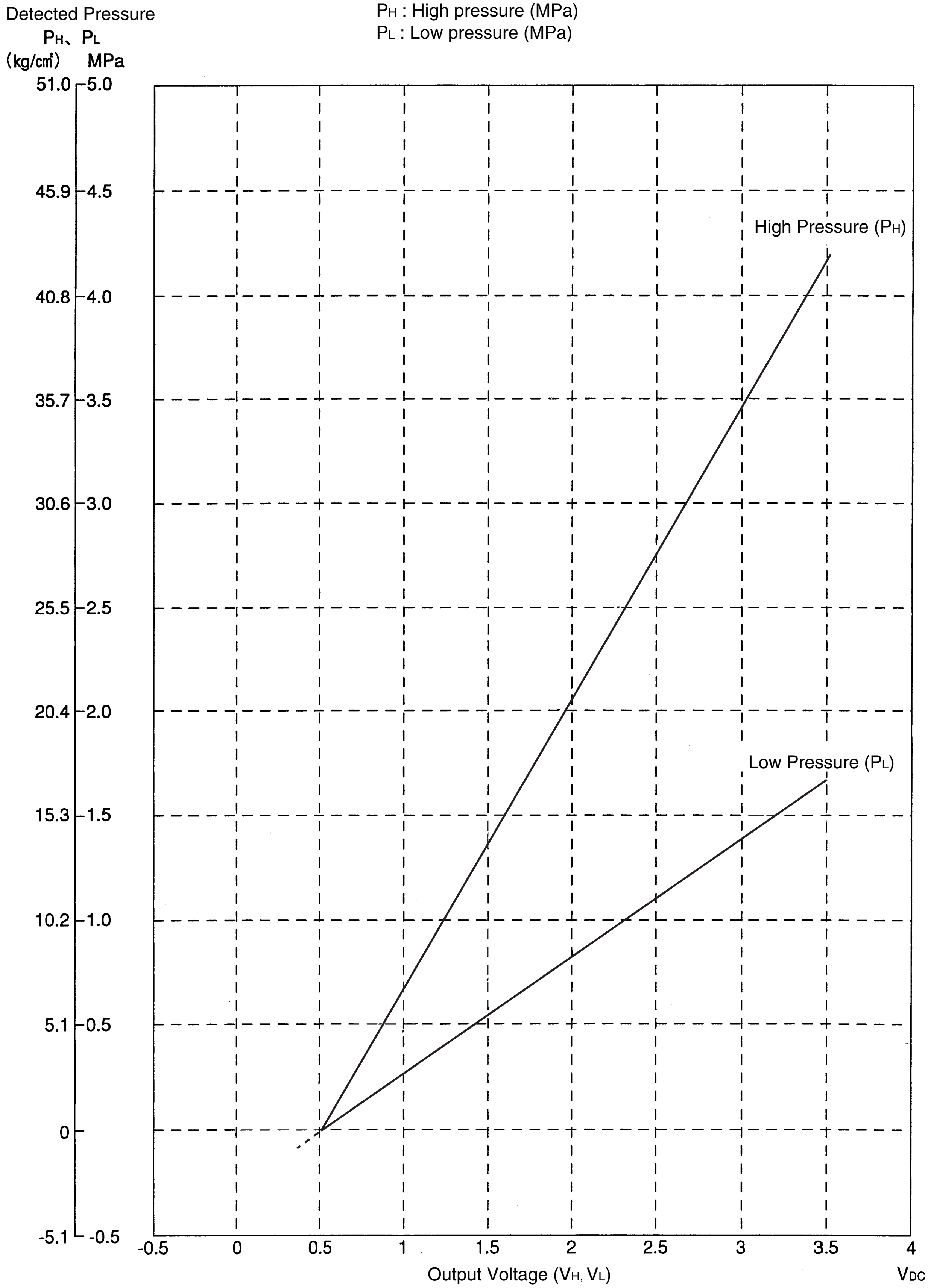
Outdoor Unit Thermistors for Discharge Pipe (R3T, R31~33T)

T°C	kΩ	T°C	kΩ	T°C	kΩ	T°C	kΩ	T°C	kΩ	T°C	kΩ
0	640.44	0.5	624.65	50	72.32	50.5	70.96	100	13.35	100.5	13.15
1	609.31	1.5	594.43	51	69.64	51.5	68.34	101	12.95	101.5	12.76
2	579.96	2.5	565.78	52	67.06	52.5	65.82	102	12.57	102.5	12.38
3	552.00	3.5	538.63	53	64.60	53.5	63.41	103	12.20	103.5	12.01
4	525.63	4.5	512.97	54	62.24	54.5	61.09	104	11.84	104.5	11.66
5	500.66	5.5	488.67	55	59.97	55.5	58.87	105	11.49	105.5	11.32
6	477.01	6.5	465.65	56	57.80	56.5	56.75	106	11.15	106.5	10.99
7	454.60	7.5	443.84	57	55.72	57.5	54.70	107	10.83	107.5	10.67
8	433.37	8.5	423.17	58	53.72	58.5	52.84	108	10.52	108.5	10.36
9	413.24	9.5	403.57	59	51.98	59.5	50.96	109	10.21	109.5	10.06
10	394.16	10.5	384.98	60	49.96	60.5	49.06	110	9.92	110.5	9.78
11	376.05	11.5	367.35	61	48.19	61.5	47.33	111	9.64	111.5	9.50
12	358.88	12.5	350.62	62	46.49	62.5	45.67	112	9.36	112.5	9.23
13	342.58	13.5	334.74	63	44.86	63.5	44.07	113	9.10	113.5	8.97
14	327.10	14.5	319.66	64	43.30	64.5	42.54	114	8.84	114.5	8.71
15	312.41	15.5	305.33	65	41.79	65.5	41.06	115	8.59	115.5	8.47
16	298.45	16.5	291.73	66	40.35	66.5	39.65	116	8.35	116.5	8.23
17	285.18	17.5	278.80	67	38.96	67.5	38.29	117	8.12	117.5	8.01
18	272.58	18.5	266.51	68	37.63	68.5	36.98	118	7.89	118.5	7.78
19	260.60	19.5	254.72	69	36.34	69.5	35.72	119	7.68	119.5	7.57
20	249.00	20.5	243.61	70	35.11	70.5	34.51	120	7.47	120.5	7.36
21	238.36	21.5	233.14	71	33.92	71.5	33.35	121	7.26	121.5	7.16
22	228.05	22.5	223.08	72	32.78	72.5	32.23	122	7.06	122.5	6.97
23	218.24	23.5	213.51	73	31.69	73.5	31.15	123	6.87	123.5	6.78
24	208.90	24.5	204.39	74	30.63	74.5	30.12	124	6.69	124.5	6.59
25	200.00	25.5	195.71	75	29.61	75.5	29.12	125	6.51	125.5	6.42
26	191.53	26.5	187.44	76	28.64	76.5	28.16	126	6.33	126.5	6.25
27	183.46	27.5	179.57	77	27.69	77.5	27.24	127	6.16	127.5	6.08
28	175.77	28.5	172.06	78	26.79	78.5	26.35	128	6.00	128.5	5.92
29	168.44	29.5	164.90	79	25.91	79.5	25.49	129	5.84	129.5	5.76
30	161.45	30.5	158.08	80	25.07	80.5	24.66	130	5.69	130.5	5.61
31	154.79	31.5	151.57	81	24.26	81.5	23.87	131	5.54	131.5	5.46
32	148.43	32.5	145.37	82	23.48	82.5	23.10	132	5.39	132.5	5.32
33	142.37	33.5	139.44	83	22.73	83.5	22.36	133	5.25	133.5	5.18
34	136.59	34.5	133.79	84	22.01	84.5	21.65	134	5.12	134.5	5.05
35	131.06	35.5	128.39	85	21.31	85.5	20.97	135	4.98	135.5	4.92
36	125.79	36.5	123.24	86	20.63	86.5	20.31	136	4.86	136.5	4.79
37	120.76	37.5	118.32	87	19.98	87.5	19.67	137	4.73	137.5	4.67
38	115.95	38.5	113.62	88	19.36	88.5	19.05	138	4.61	138.5	4.55
39	111.35	39.5	109.13	89	18.75	89.5	18.46	139	4.49	139.5	4.44
40	106.96	40.5	104.84	90	18.17	90.5	17.89	140	4.38	140.5	4.32
41	102.76	41.5	100.73	91	17.61	91.5	17.34	141	4.27	141.5	4.22
42	98.75	42.5	96.81	92	17.07	92.5	16.80	142	4.16	142.5	4.11
43	94.92	43.5	93.06	93	16.54	93.5	16.29	143	4.06	143.5	4.01
44	91.25	44.5	89.47	94	16.04	94.5	15.79	144	3.96	144.5	3.91
45	87.74	45.5	86.04	95	15.55	95.5	15.31	145	3.86	145.5	3.81
46	84.38	46.5	82.75	96	15.08	96.5	14.85	146	3.76	146.5	3.72
47	81.16	47.5	79.61	97	14.62	97.5	14.40	147	3.67	147.5	3.62
48	78.09	48.5	76.60	98	14.18	98.5	13.97	148	3.58	148.5	3.54
49	75.14	49.5	73.71	99	13.76	99.5	13.55	149	3.49	149.5	3.45
50	72.32	50.5	70.96	100	13.35	100.5	13.15	150	3.41	150.5	3.37

CHECK 12 Pressure Sensor

$P_H = 1.38V_H - 0.69$
$P_L = 0.57V_L - 0.28$
P_H : High pressure (MPa)
P_L : Low pressure (MPa)

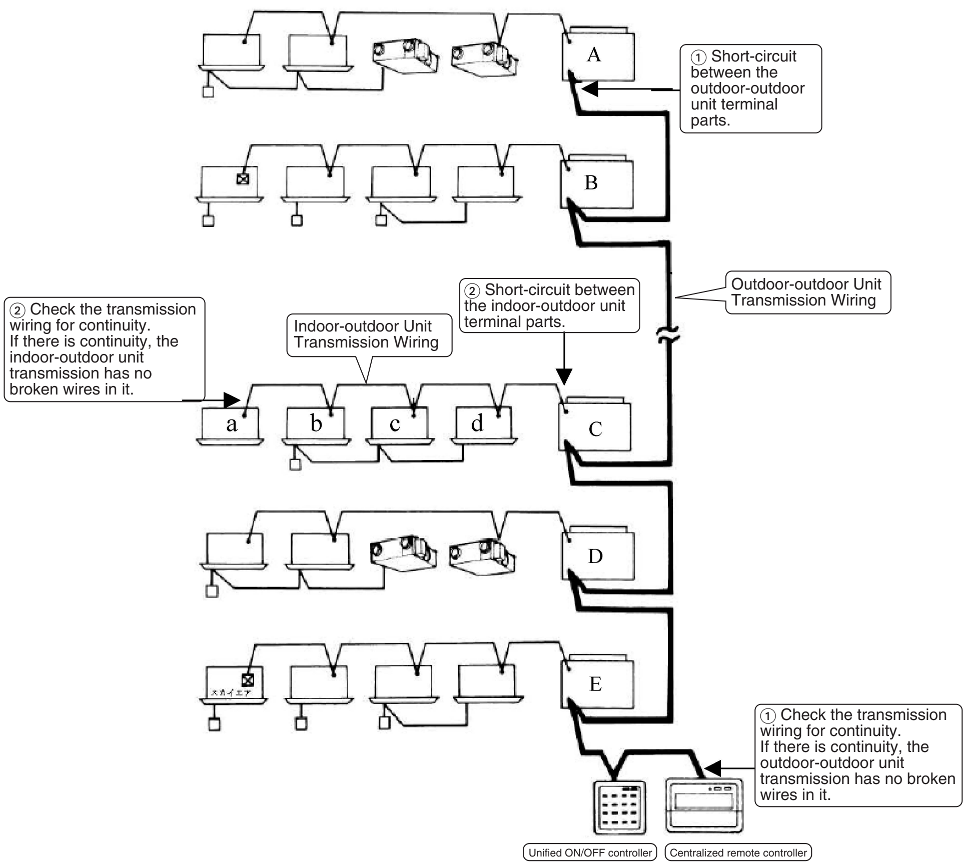
V_H : Output Voltage [High Side] V_{DC}
V_L : Output Voltage [Low Side] V_{DC}



(V3053)

CHECK 13 Broken Wire Check of the Connecting Wires

1. Procedure for checking outdoor-outdoor unit transmission wiring for broken wires
   On the system shown below, turn OFF the power supply to all equipment, short-circuit between the outdoor-outdoor unit terminal parts F1 and F2 in the "Outdoor Unit A" that is farthest from the centralized remote controller, and then conduct continuity checks between the transmission wiring terminal blocks F1 and F2 of the centralized remote controller using a multiple meter. If there is continuity between the said terminal blocks, the outdoor-outdoor unit transmission wiring has no broken wires in it.
   If there is no continuity, the transmission wiring may have broken wires. With the outdoor-outdoor unit terminal parts of the "Outdoor Unit A" short-circuited, conduct continuity checks between the transmission wiring terminal blocks F1 and F2 of the unified ON/OFF controller. If there is no continuity as well, conduct continuity checks between the outdoor-outdoor unit terminal parts of the "Outdoor Unit E", between the outdoor-outdoor unit terminal parts of the "Outdoor Unit D", between the outdoor-outdoor unit terminal parts of the "Outdoor Unit C", … in the order described, thus identifying the place with continuity.
   If the place with continuity can be identified, there may be broken wires in places before the said place with continuity.
2. Procedure for checking indoor-outdoor unit transmission wiring for broken wires (for checking the indoor-outdoor unit transmission wiring of the "Outdoor Unit C" for broken wires)
   Turn OFF the power supply to all equipment, short-circuit between the indoor-outdoor unit terminal parts F1 and F2 in the "Outdoor Unit C, and then conduct continuity checks between the transmission wirings F1 and F2 of the "Indoor Unit a" that is farthest from the "Outdoor Unit C" using a multiple meter. If there is continuity between the said transmission wirings, the indoor-outdoor unit transmission wiring has no broken wires in it.
   If there is no continuity, the transmission wiring may have broken wires. With the indoor-outdoor unit terminal parts of the "Outdoor Unit C" short-circuited, identify the place with continuity in the transmission wiring of the "Indoor Unit b", transmission wiring of the "Indoor Unit c", and transmission wiring of the "Indoor Unit d" in the order described.
   If the place with continuity can be identified, there may be broken wires in places before the said place with continuity.



CHECK 14 Master Unit Central Connector Setting Table

The master unit central setting connector (CN1/X1A) is mounted at the factory.

- To independently use a single unit of the intelligent Touch Controller or a single unit of the centralized remote controller, do not dismount the master unit central setting connector (i.e., use the connector with the factory setting unchanged).
- To independently use the schedule timer, insert an independent-use setting connector. No independent-use setting connector has been mounted at the factory. Insert the connector, which is attached to the casing of the main unit, in the PCB (CN1/X1A). (Independent-use connector=Master unit central setting connector)
- To use two or more centralized controller in combination, make settings according to the table shown below.

<table>
<tr><th rowspan="2">Pattern</th><th colspan="4">Centralized controller connection pattern</th><th colspan="4">Setting of master unit central setting connector(*2)</th></tr>
<tr><th>intelligent Touch Controller</th><th>Centralized remote controller</th><th>Unified ON/OFF controller</th><th>Schedule timer</th><th>intelligent Touch Controller</th><th>Centralized remote controller</th><th>Unified ON/OFF controller</th><th>Schedule timer</th></tr>
<tr><td>①</td><td>1 to 2 units</td><td></td><td></td><td>× (*1)</td><td>Only a single unit: "Provided", Others: "Not provided"</td><td></td><td></td><td></td></tr>
<tr><td>②</td><td rowspan="2">1 unit</td><td rowspan="2">1 unit</td><td></td><td>× (*1)</td><td rowspan="2">Provided</td><td rowspan="2">Not provided</td><td></td><td></td></tr>
<tr><td>③</td><td rowspan="2">1 to 8 units</td><td>× (*1)</td><td rowspan="2">All "Not provided"</td><td></td></tr>
<tr><td>④</td><td>1 to 2 units</td><td></td><td>× (*1)</td><td>Only a single unit: "Provided", Others: "Not provided"</td><td></td><td></td></tr>
<tr><td>⑤</td><td></td><td rowspan="4">1 to 4 units</td><td></td><td></td><td></td><td rowspan="4">Only a single unit: "Provided", Others: "Not provided"</td><td></td><td></td></tr>
<tr><td>⑥</td><td></td><td rowspan="2">1 to 16 units</td><td>1 unit</td><td></td><td rowspan="2">All "Not provided"</td><td>Not provided</td></tr>
<tr><td>⑦</td><td></td><td></td><td></td><td></td></tr>
<tr><td>⑧</td><td></td><td></td><td>1 unit</td><td></td><td></td><td>Not provided</td></tr>
<tr><td>⑨</td><td></td><td></td><td rowspan="2">1 to 16 units</td><td></td><td></td><td></td><td rowspan="2">Only a single unit: "Provided", Others: "Not provided"</td><td></td></tr>
<tr><td>⑩</td><td></td><td></td><td>1 unit</td><td></td><td></td><td>Not provided</td></tr>
<tr><td>⑪</td><td></td><td></td><td></td><td>1 unit</td><td></td><td></td><td></td><td>Provided</td></tr>
</table>

(*1) The intelligent Touch Controller and the schedule timer are not available for combined use.

(*2) The intelligent Touch Controller, centralized remote controller, and the unified ON/OFF controller have been set to "Provided with the master unit central setting connector" at the factory. The schedule timer has been set to "Not provided with the master unit central setting connector" at the factory, which is attached to the casing of the main unit.

CHECK 15 Master-Slave Unit Setting Table

Combination of intelligent Touch Controller and Centralized Remote Controller

*	#1		#2		#3		#4	
Pattern	1-00~4-15	Master/ Slave	5-00~8-15	Master/ Slave	1-00~4-15	Master/ Slave	5-00~8-15	Master/ Slave
①	CRC	Master	CRC	Master	CRC	Slave	CRC	Slave
②	CRC	Master	—	—	CRC	Slave	—	—
③	intelligent Touch Controller	Master	—	—	intelligent Touch Controller	Slave	—	—
④	CRC	Master	—	—	intelligent Touch Controller	Slave	—	—
⑤	intelligent Touch Controller	Master	—	—	CRC	Slave	—	—
⑥	CRC	Master	—	—	—	—	—	—
⑦	intelligent Touch Controller	Master	—	—	—	—	—	—

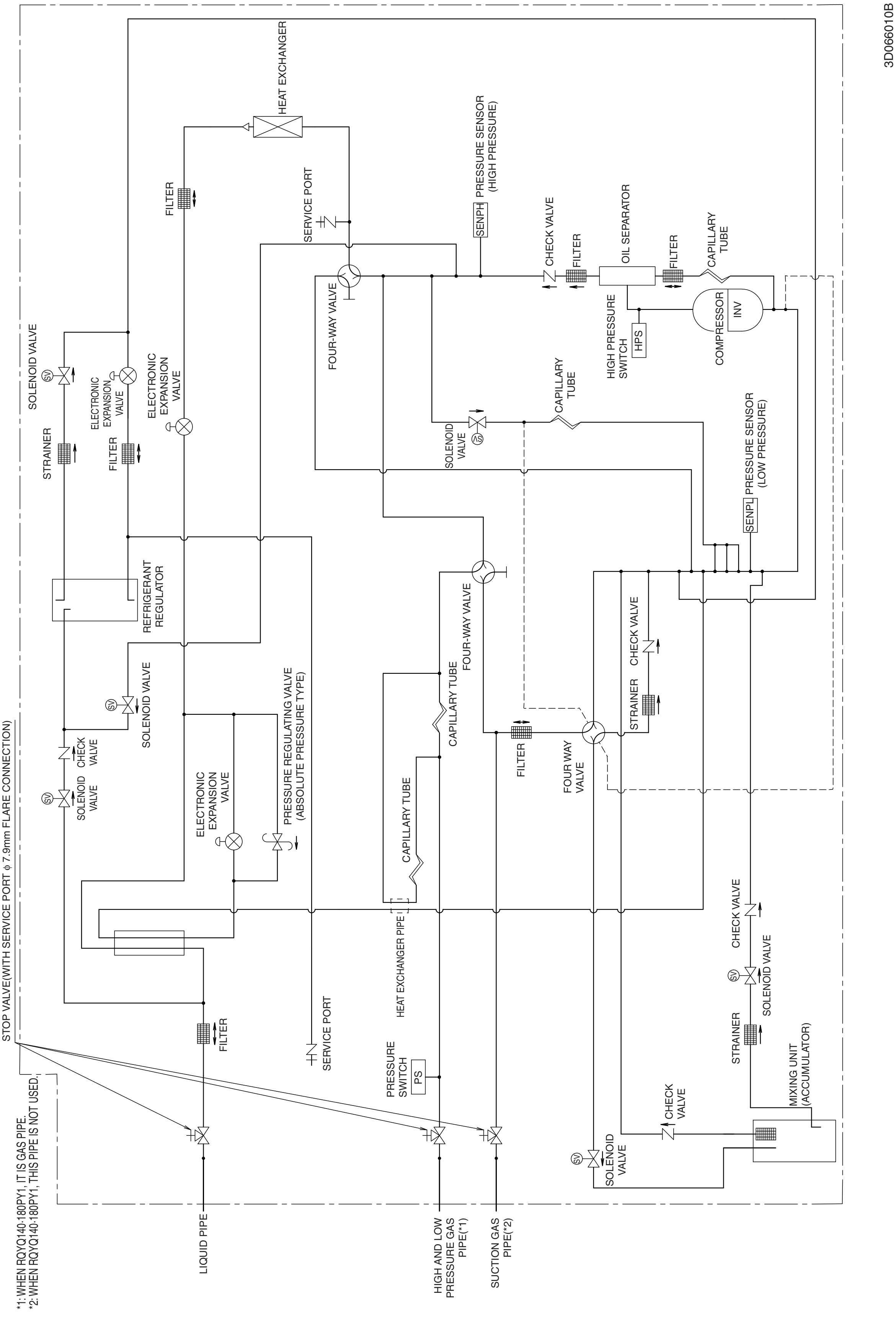
CRC: Centralized remote controller <DCS302CA61>
intelligent Touch Controller: <DCS601C51>
The patterns marked with "" have nothing to do with those described in the list of Setting of master unit central setting connector.

Part 7
Appendix

1. Piping Diagrams

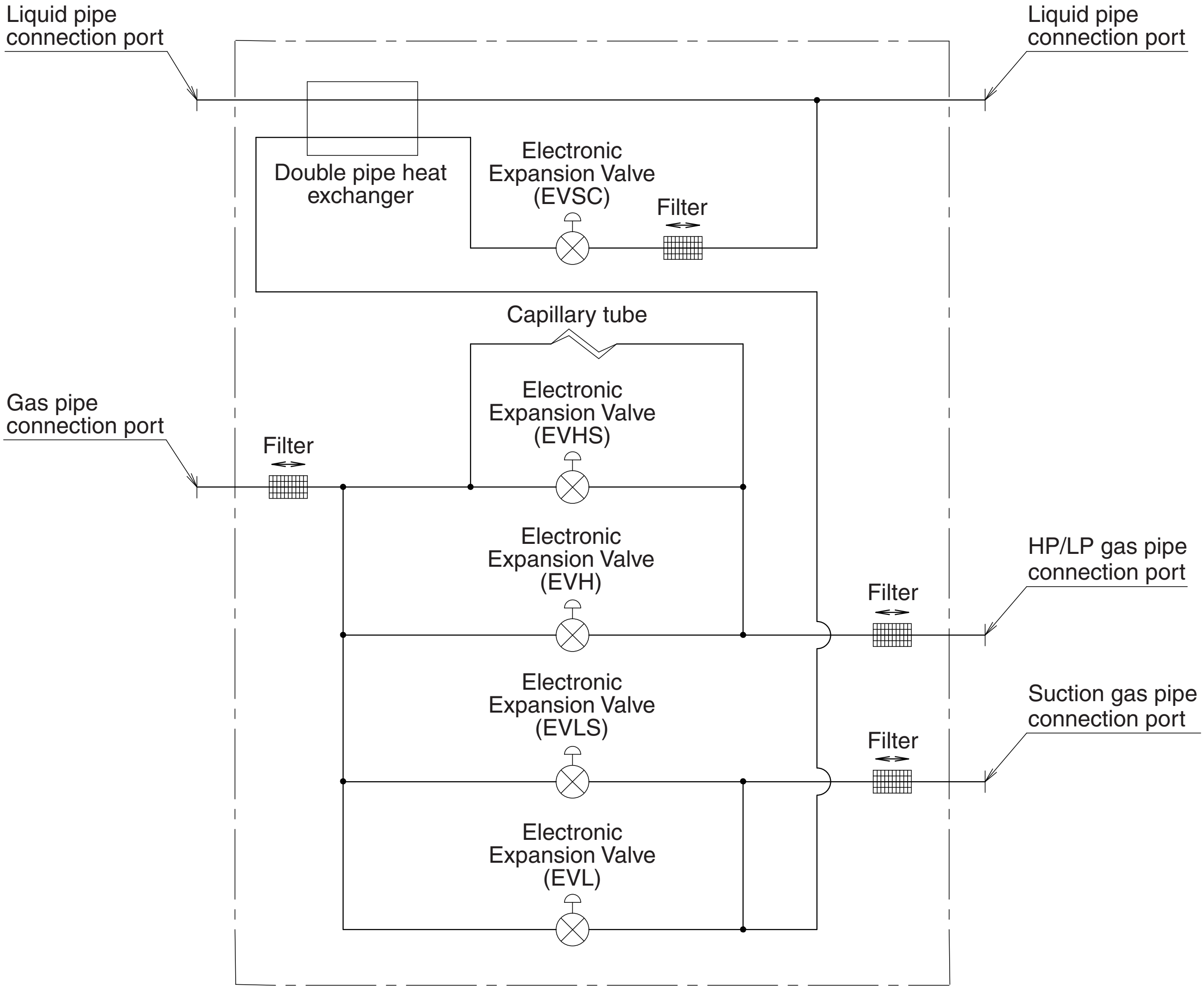
1.1 Outdoor Unit

RQYQ140, 180PY1
RQEQ140, 180, 212PY1



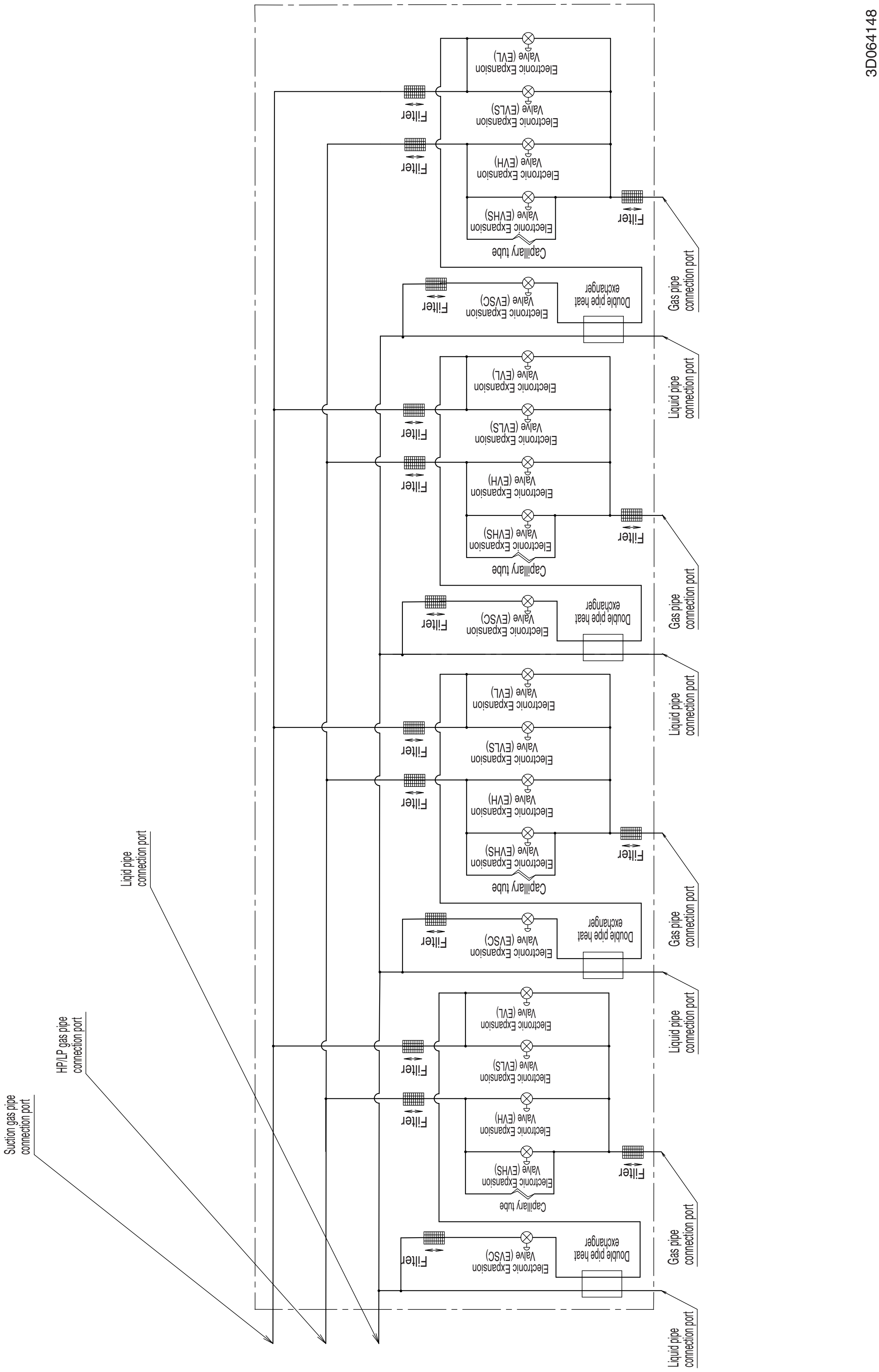
1.2 BS Unit

BSVQ100, 160, 250P

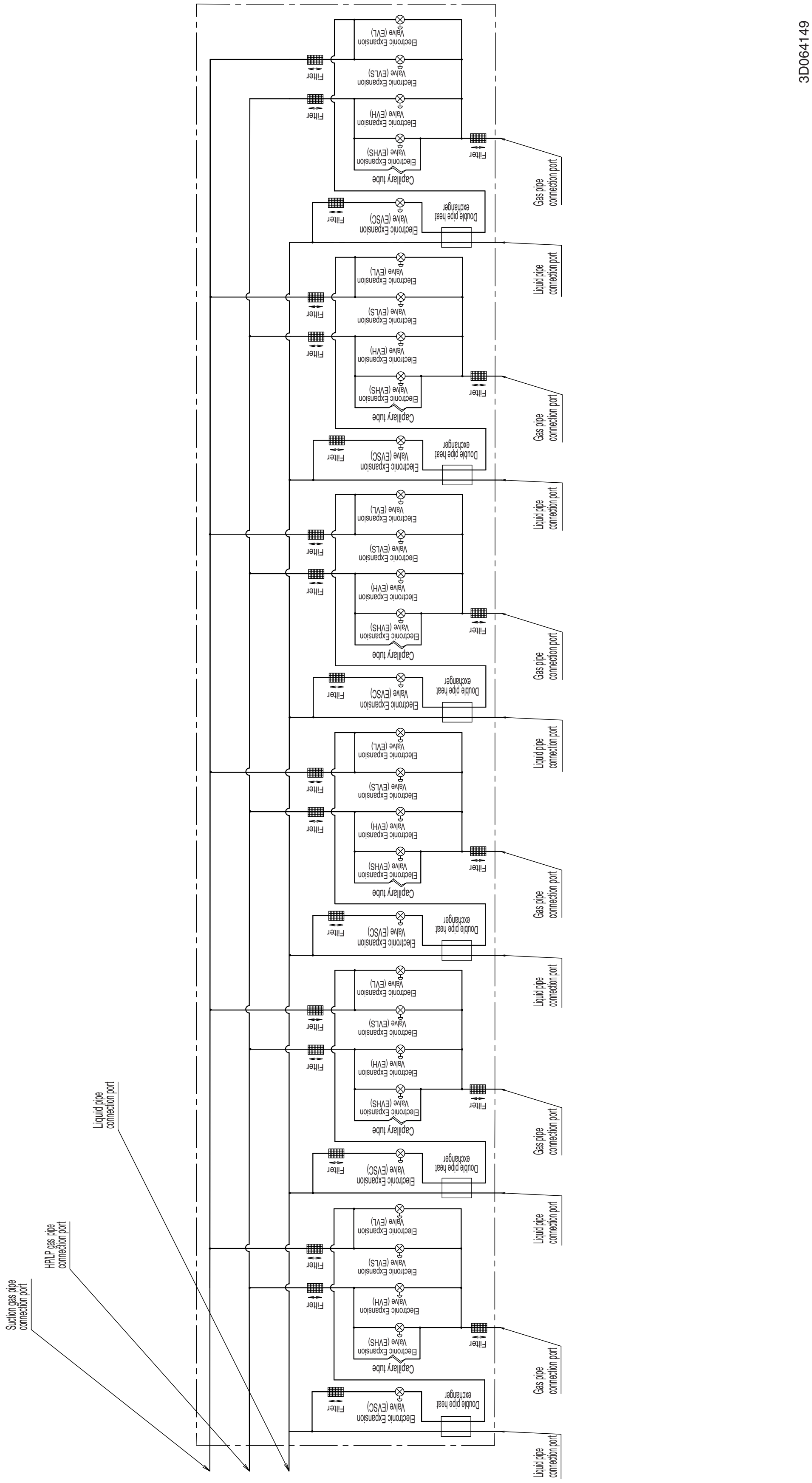


4D057985B

BSV4Q100P


3D064148
Electronic Expansion Valve (EVL)
Electronic Expansion Valve (EVLS)
Electronic Expansion Valve (EVH)
Electronic Expansion Valve (EVHS)
Electronic Expansion Valve (EVSC)
Capillary tube
Double pipe heat exchanger
Filter
Gas pipe connection port
Liquid pipe connection port
HP/LP gas pipe connection port
Suction gas pipe connection port

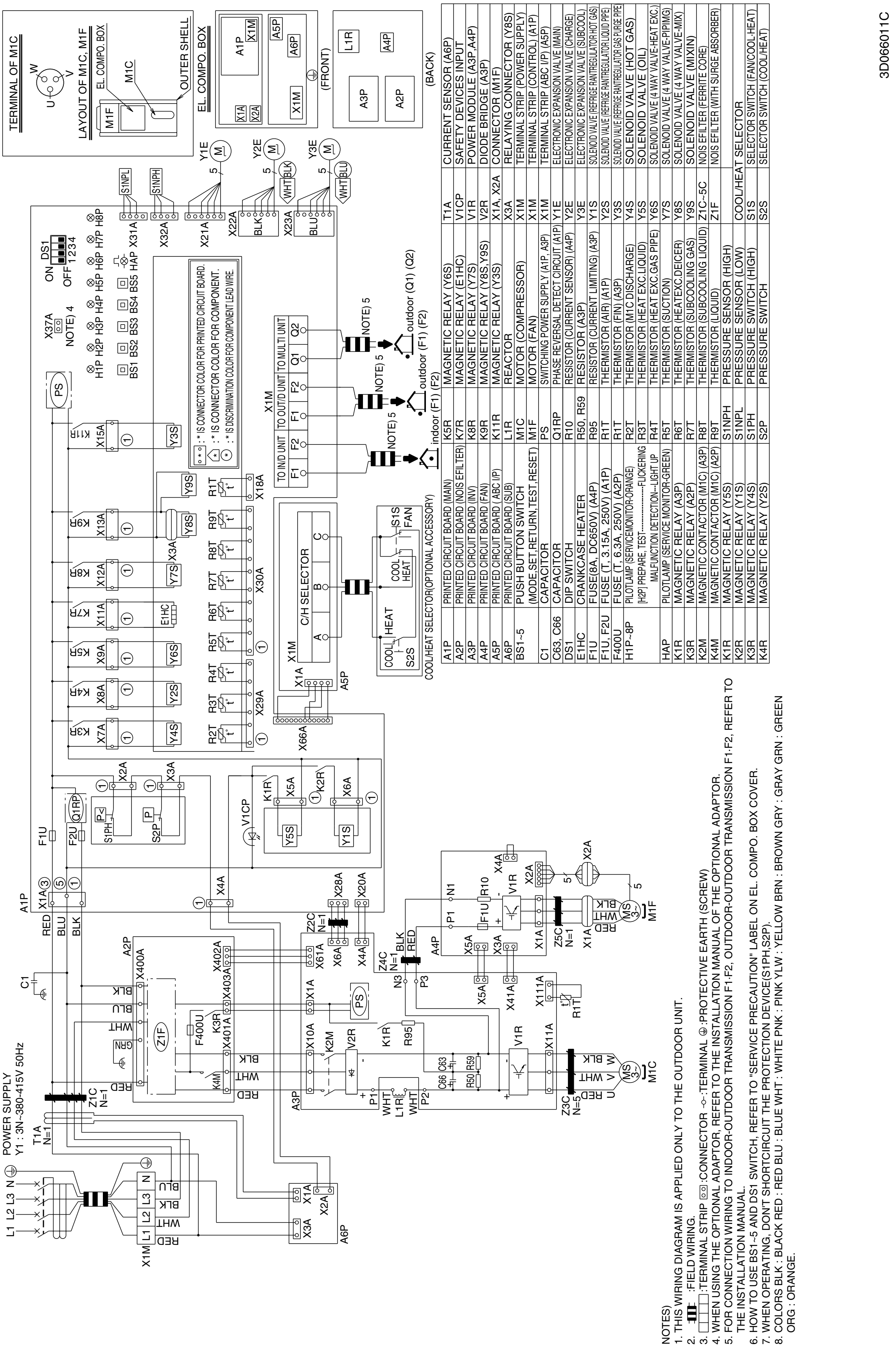
BSV6Q100P


Electronic Expansion Valve (EVL)
Electronic Expansion Valve (EVLS)
Electronic Expansion Valve (EVH)
Electronic Expansion Valve (EVHS)
Electronic Expansion Valve (EVSC)
Capillary tube
Double pipe heat exchanger
Filter
Gas pipe connection port
Liquid pipe connection port
Suction gas pipe connection port
HP/LP gas pipe connection port
3D064149

2. Wiring Diagrams for Reference

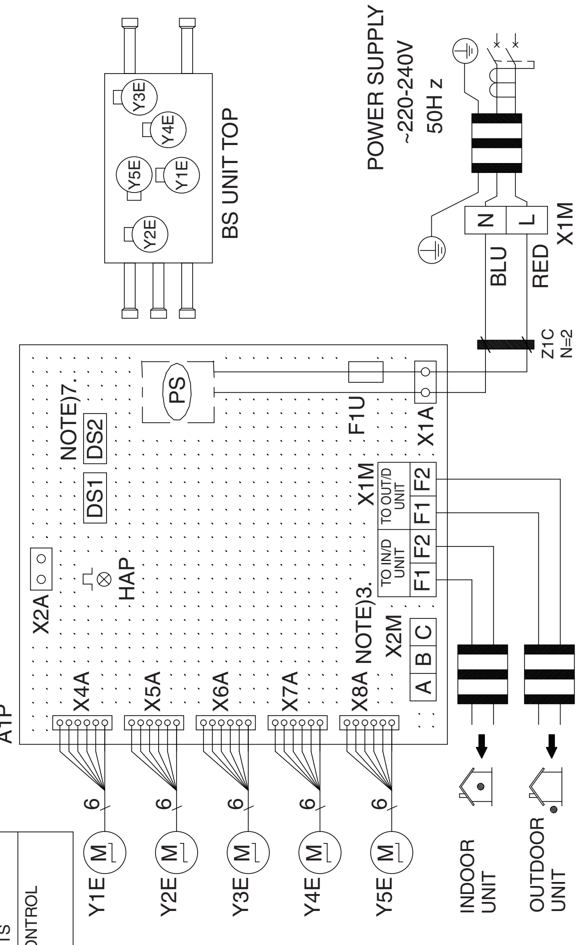
2.1 Outdoor Unit

RQYQ140, 180PY1
RQEQ140, 180, 212PY1



2.2 BS Unit

BSVQ100, 160, 250P



A1P	PRINTED CIRCUIT BOARD	Y2E	ELECTRONIC EXPANSION VALVE(SUB DISCHARGE)
DS1,DS2	DIP SWITCH	Y3E	ELECTRONIC EXPANSION VALVE(SUB SUCTION)
F1U	FUSE(T, 3, 15A, 250V)	Y4E	ELECTRONIC EXPANSION VALVE(MAIN DISHARGE)
HAP	FLASHING LAMP (SERVICE MONITOR-GREEN)	Y5E	ELECTRONIC EXPANSION VALVE(MAIN SUCTION)
		Z1C	NOISE FILTER(FERRITE CORE)
PS	SWITCHING POWER SUPPLY (A1P)		CONNECTOR FOR OPTIONAL PARTS
X1M	TERMINAL STRIP(POWER)	X2A	CONNECTOR (WIRING EXTERNAL CONTROL ADAPTOR FOR OUTDOOR UNIT)
X1M(A1P)	TERMINAL STRIP(CONTROL)		
X2M	TERMINAL STRIP(C/H SELECTOR)		
Y1E	ELECTRONIC EXPANSION VALVE(SUB COOL)		

NOTES) 1. THIS WIRING DIAGRAM APPLIES TO THE BS UNIT ONLY.

2. ☐☐☐ :TERMINAL STRIP, ○○ :CONNECTOR, —○— :TERMINAL

   —▮▮▮— :FIELD WIRING, ⏚ :PROTECTIVE EARTH

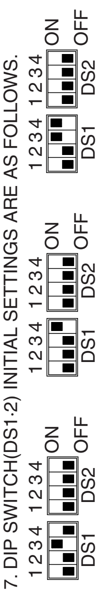
3. WHEN USING THE COOL/HEAT SELECTOR(OPTIONAL ACCESSORY), CONNECT IT TO TERMINALS A, B AND C ON X2M.

4. AS FOR WIRING TO THE IN/D UNIT(F1)·(F2) AND OUT/D UNIT (F1)·(F2) ON X1M(A1P),REFER TO INSTALLATION MANUAL.

5. SYMBOLS SHOW AS FOLLOWS. (BLU : BLUE RED : RED)

6. USE COPPER CONDUCTORS ONLY.

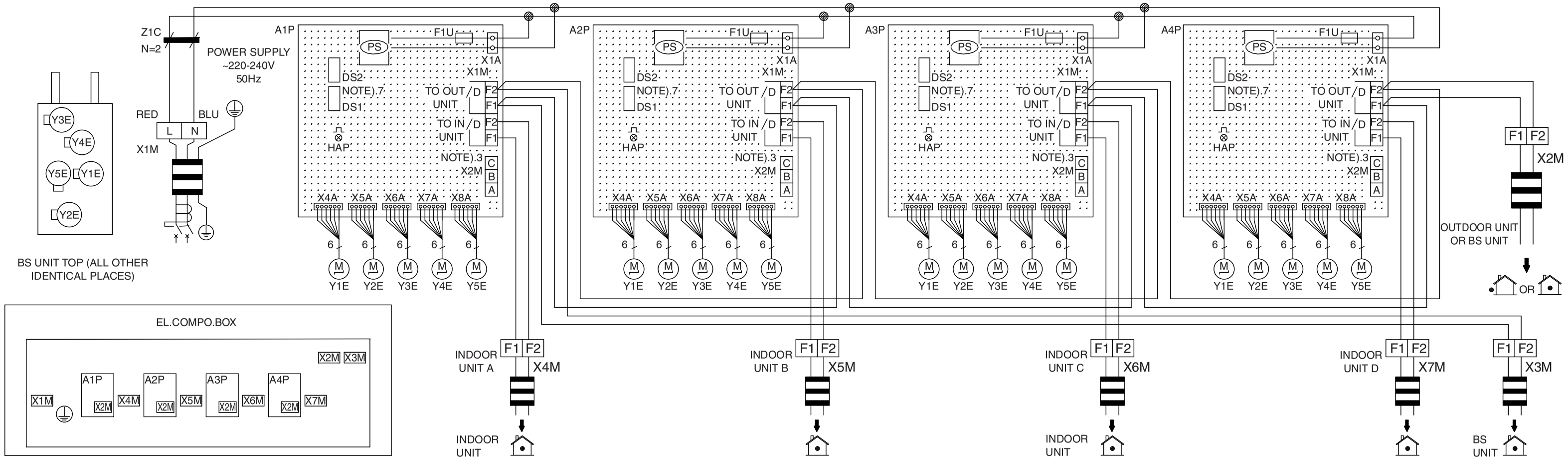
7. DIP SWITCH(DS1·2) INITIAL SETTINGS ARE AS FOLLOWS.



BSVQ100PV1 BSVQ160PV1 BSVQ250PV1

FOR USING DIP SWITCH(DS1·2), REFER TO INSTALLATION MANUAL OR "SERVICE PRECAUTION" LABEL ON EL. COMPO. BOX COVER.

BSV4Q100P



NOTES)1. THIS WIRING DIAGRAM APPLIES TO THE BS UNIT ONLY.
2. ▭▭▭ : TERMINAL STRIP, ○○ : CONNECTOR
▬▮▬ : FIELD WIRING, ⏚ : PROTECTIVE EARTH
3. WHEN USING THE COOL/HEAT SELECTOR(OPTIONAL ACCESSORY), CONNECT IT TO TERMINALS A, B AND C ON X2M(A1P~A4P).
4. AS FOR WIRING TO THE X2M~X7M(CONTROL), REFER TO INSTALLATION MANUAL.
5. SYMBOLS SHOW AS FOLLOWS.(BLU : BLUE RED : RED)
6.USE COPPER CONDUCTORS ONLY.
7.DIP SWITCH(DS1·2) INITIAL SETTINGS ARE AS FOLLOES.

1 2 3 4 1 2 3 4 ON
DS1 DS2 OFF

FOR USING DIP SWITCH(DS1·2), REFER TO INSTALLATION MANUAL OR "SERVICE PRECAUTION" LABEL ON EL.COMPO.BOX COVER.

A1P(UNIT A)	PRINTED CIRCUIT BOARD(INDOOR UNIT A)	X2M(A1P~A4P)	TERMINAL STRIP(C/H SELECTOR)
A2P(UNIT B)	PRINTED CIRCUIT BOARD(INDOOR UNIT B)	X1M	TERMINAL STRIP(POWER)
A3P(UNIT C)	PRINTED CIRCUIT BOARD(INDOOR UNIT C)	X2M~X7M	TERMINAL STRIP(CONTROL)
A4P(UNIT D)	PRINTED CIRCUIT BOARD(INDOOR UNIT D)	Y1E	ELECTRONIC EXPANSION VALVE(SUB COOL)
DS1, DS2	DIP SWITCH	Y2E	ELECTRONIC EXPANSION VALVE(SUB DISCHARGE)
F1U	FUSE(T, 3.15A, 250V)	Y3E	ELECTRONIC EXPANSION VALVE(SUB SUCTION)
HAP	FLASHING LAMP (SERVICE MONITOR-GREEN)	Y4E	ELECTRONIC EXPANSION VALVE(MAIN DISHARGE)
		Y5E	ELECTRONIC EXPANSION VALVE(MAIN SUCTION)
PS	SWITCHING POWER SUPPLY(A1P~A4P)	Z1C	NOISE FILTER(FERITE CORE)
X1M(A1P~A4P)	TERMINAL STRIP(CONTROL)		

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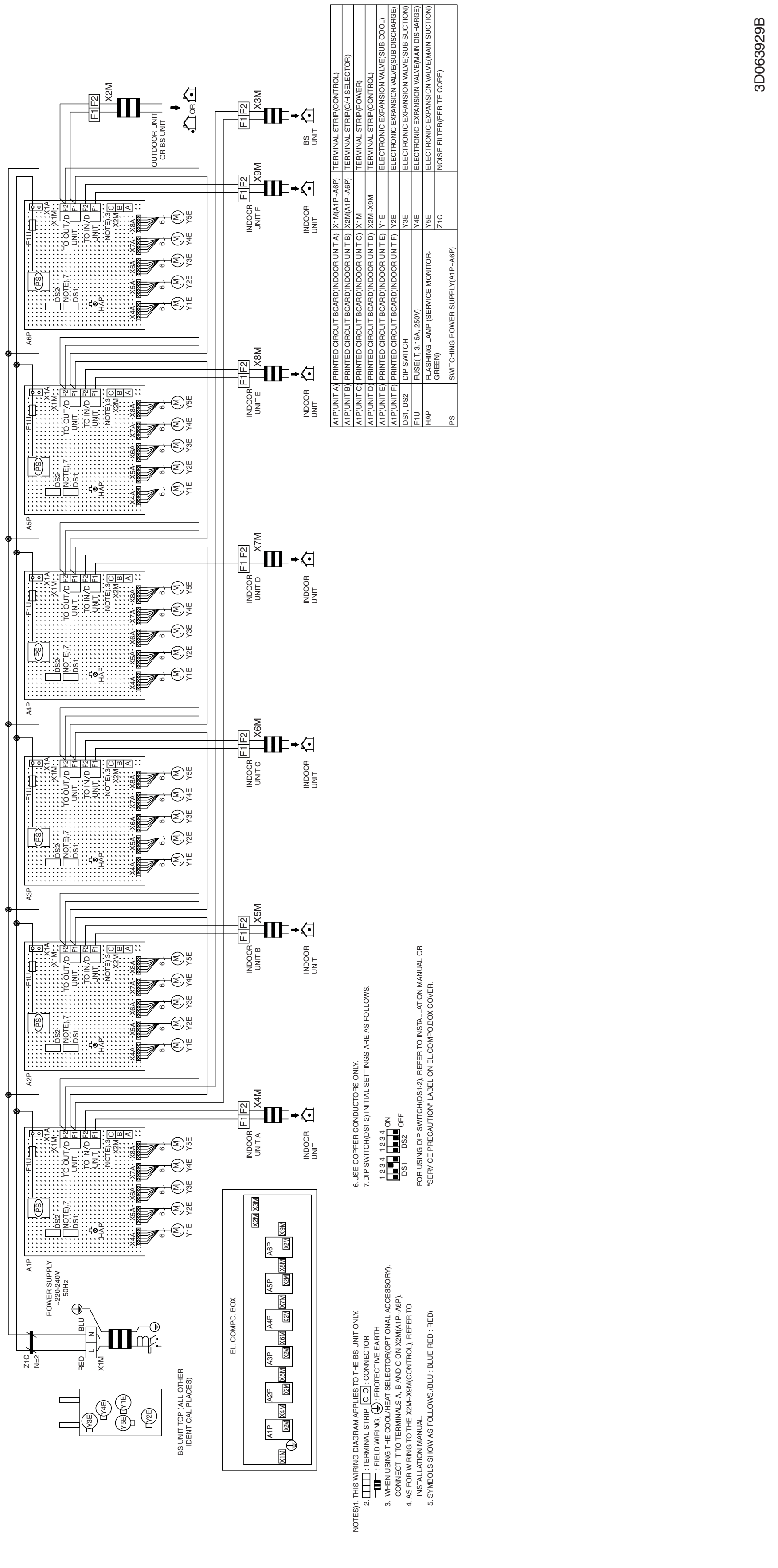
BSV6Q100P


3D063929B
A1P
A2P
A3P
A4P
A5P
A6P
X1M
X2M
X3M
X4M
X5M
X6M
X7M
X8M
X9M
Z1C
EL. COMPO. BOX
POWER SUPPLY
~220-240V
50Hz
OUTDOOR UNIT OR BS UNIT
BS UNIT
INDOOR UNIT A
INDOOR UNIT B
INDOOR UNIT C
INDOOR UNIT D
INDOOR UNIT E
INDOOR UNIT F
BS UNIT TOP (ALL OTHER IDENTICAL PLACES)

3. Option List

3.1 Option Lists (Outdoor Unit)

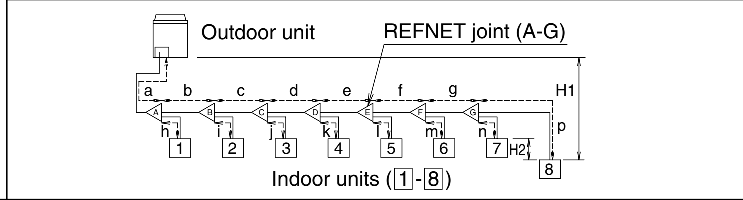
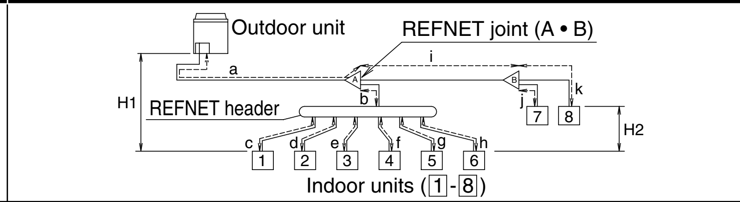
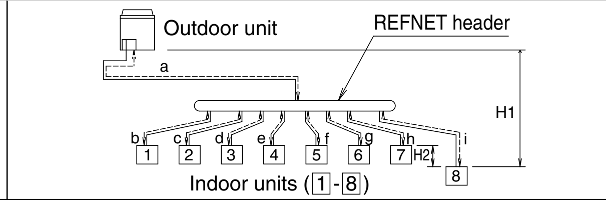
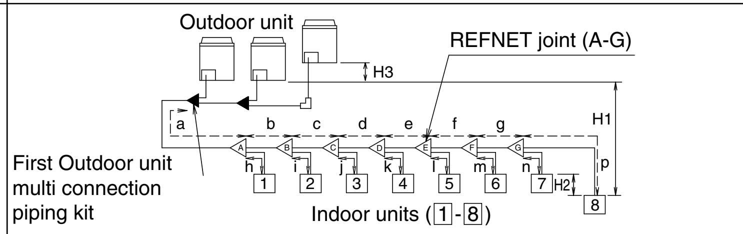
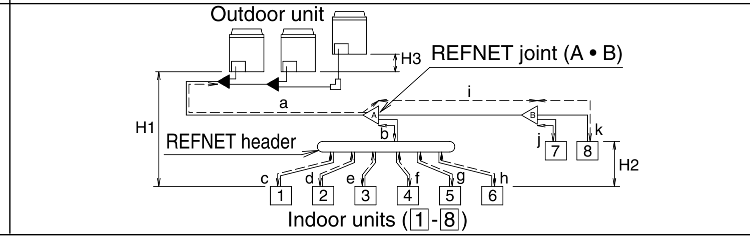
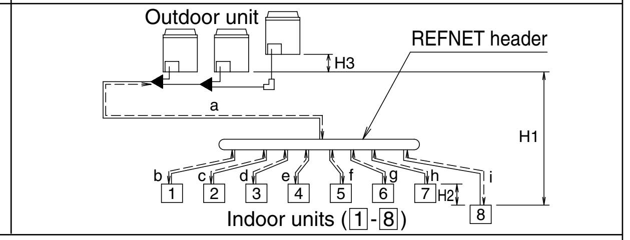
Series		VRV III-Q				
Option name	Model	RQYQ140PY1	RQYQ180PY1	RQCYQ280PY1 RQCYQ360PY1	RQCYQ460PY1 RQCYQ500PY1	RQCYQ540PY1
Cool/Heat selector		KRC19-26A				
Fixing box		KJB111A				
Distributive piping	REFNET header	KHRP26M22H(MaX. 4 branch)	KHRP26M22H(Max. 4 branch) KHRP26M33H(Max. 8 branch)	KHRP26M22H(Max. 4 branch) KHRP26M33H(Max. 8 branch) KHRP26M72H(Max. 8 branch)		KHRP26M22H(Max. 4 branch) KHRP26M33H(Max. 8 branch) KHRP26M72H(Max. 8 branch) KHRP26M73H(Max. 8 branch)
	REFNET joint	KHRP26A22T(Max. 4 branch)	KHRP26A22T(Max. 4 branch) KHRP26A33T(Max. 8 branch)	KHRP26A22T(Max. 4 branch) KHRP26A33T(Max. 8 branch) KHRP26A72T(Max. 8 branch)		KHRP26A22T(Max. 4 branch) KHRP26A33T(Max. 8 branch) KHRP26A72T(Max. 8 branch) KHRP26A73T(Max. 8 branch)
Pipe size reducer						
Outdoor unit multi connection piping kit				BHFP22P36C	BHFP22P54C	

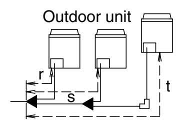
Series		VRV III-Q			
Option name	Model	RQCEQ280PY1 RQCEQ360PY1	RQCEQ460PY1 RQCEQ500PY1	RQCEQ540PY1 RQCEQ636PY1	RQCEQ712PY1 RQCEQ744PY1 RQCEQ816PY1 RQCEQ848PY1
Cool/Heat selector					
Fixing box		KJB111A			
Distributive piping	REFNET header	KHRP25M33H(Max. 8 branch), KHRP25M72H(Max. 8 branch) KHRP26M22H(Max. 4 branch), KHRP26M33H(Max. 8 branch)		KHRP25M33H(Max. 8 branch) KHRP25M72H(Max. 8 branch) KHRP25M73H(Max. 8 branch) KHRP26M22H(Max. 4 branch) KHRP26M33H(Max. 8 branch)	KHRP25M33H(Max. 8 branch) KHRP25M72H(Max. 8 branch) KHRP25M73H(Max. 8 branch) KHRP26M22H(Max. 4 branch) KHRP26M33H(Max. 8 branch) KHRP26M72H(Max. 8 branch)
	REFNET joint	KHRP25A22T(Max. 4 branch), KHRP25A33T(Max. 8 branch) KHRP25A72T(Max. 8 branch), KHRP26A22T(Max. 4 branch) KHRP26A33T(Max. 8 branch)		KHRP25A22T(Max. 4 branch) KHRP25A33T(Max. 8 branch) KHRP25A72T(Max. 8 branch) KHRP25A73T(Max. 8 branch) KHRP26A22T(Max. 4 branch) KHRP26A33T(Max. 8 branch)	KHRP25A22T(Max. 4 branch) KHRP25A33T(Max. 8 branch) KHRP25A72T(Max. 8 branch) KHRP25A73T(Max. 8 branch) KHRP26A22T(Max. 4 branch) KHRP26A33T(Max. 8 branch) KHRP26A72T(Max. 8 branch)
Pipe size reducer					
Outdoor unit multi connection piping kit		BHFP26P36C	BHFP26P63C		BHFP26P84C

3D066354

4. Example of connection (R-410A Type)

■ Heat Pump series (RQ(C)YQ)

Example of connection (Connection of 8 indoor units)		**Example refrigerant branch using REFNET joint**	**Example refrigerant branch using REFNET joint and REFNET header**	**Example refrigerant branch using REFNET header**
(∗1) “ ◄ ” indicate the Outdoor unit multi connection piping kit (∗2) In case of multi outdoor system, re-read to the first Outdoor unit multi connection piping kit as seen from the indoor unit.	Single outdoor system			
	Multi outdoor system			

			REFNET joint	REFNET joint and REFNET header	REFNET header
Maximum allowable length	Between outdoor (∗2) and indoor units	Actual pipe length	Pipe length between outdoor (∗2) and indoor units ≤ 120m		
			Example unit 8 : a + b + c + d + e + f + g + p ≤ 120m	Example unit 6 : a + b + h ≤ 165m, unit 8 : a + i + k ≤ 120m	Example unit 8 : a + i ≤ 120m
		Equivalent length	Equivalent pipe length between outdoor (∗2) and indoor units ≤ 150m (assume equivalent pipe length of REFNET joint to be 0.5m, that of REFNET header to be 1m, calculation purposes) (See Note 1 - Next page)		
		Total extension length	Total pipe length from outdoor unit (∗2) to all indoor units ≤ 300m		
	Between outdoor unit and Outdoor unit multi connection piping kit (Only for multi system)	Actual pipe length Equivalent length	Pipe length between outdoor unit and outdoor unit multi connection piping kit ≤ 10m, equivalent length between outdoor unit and outdoor unit multi connection piping kit ≤ 13m		 r ≤ 10m (Equivalent length: ≤ 13m) s ≤ 10m (Equivalent length: ≤ 13m) t ≤ 10m (Equivalent length: ≤ 13m)
Allowable height length	Between outdoor and indoor units	Difference in height	Difference in height between outdoor and indoor units (H1) ≤ 50m (≤ 40m if the outdoor unit is below)		
	Between indoor and indoor units	Difference in height	Difference in height between indoor units (H2) ≤ 15m		
	Between outdoor and outdoor units	Difference in height	Difference in height between outdoor unit (H3) ≤ 5m		
Allowable length after the branch		Actual pipe length	Pipe length from first refrigerant branch kit (either REFNET joint or REFNET header) to indoor unit ≤ 40m		
			Example unit 8 : b + c + d + e + f + g + p ≤ 40m	Example unit 6 : b + h ≤ 40m, unit 8 :i + k ≤ 40m	Example unit 8 : i ≤ 40m

Refrigerant branch kit selection

Refrigerant branch kits can only be used with R410A.

⚠ •When multi outdoor system are installed, be sure to use the special separately sold Outdoor unit multi connection piping kit.
The table at right shows how to select the proper kit.

How to select the REFNET joint
- When using REFNET joint at the first branch counted from the outdoor unit side. Choose from the following table in accordance with the outdoor unit capacity type. (Example: REFNET joint A)

Outdoor unit capacity type	Refrigerant branch kit name
Q140·180 type	KHRP26A22T
Q280 type	KHRP26A33T
Q360~540 type	KHRP26A72T

- Choose the REFNET joints other than that for the first branch from the following table in accordance with the total capacity index of all the indoor units connected below the REFNET joint.

Indoor unit total capacity index	Refrigerant branch kit name
< 200	KHRP26A22T
200 ≤ x< 290	KHRP26A33T
290 ≤ x< 640	KHRP26A72T
640 ≤	KHRP26A73T + KHRP26M73TP

How to select the REFNET header
- Choose from the following table in accordance with the total capacity index of all the indoor units connected below the REFNET header.
- Note: 250 type indoor unit cannot be connected below the REFNET header.

Indoor unit total capacity index	Refrigerant branch kit name
< 200	KHRP26M33H
200 ≤ x< 290	KHRP26M33H
290 ≤ x< 640	KHRP26M72H
640 ≤	KHRP26M73H + KHRP26M73HP

How to select the Outdoor unit multi connection piping kit (This is required when the system is multi outdoor unit system.)
- C hoose from the following table in accordance with the number of outdoor units.

Number of outdoor units	Connection piping kit name
2 units	BHFP22P36C
3 units	BHFP22P54C

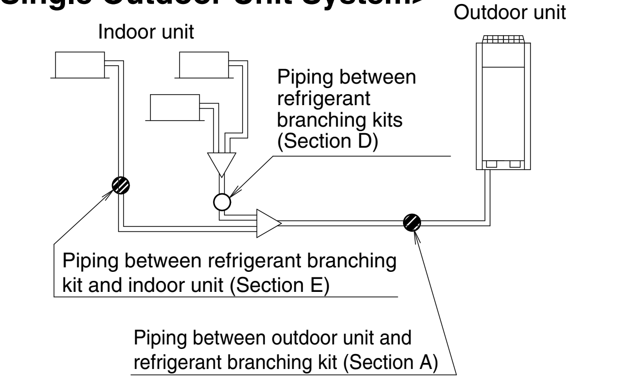
Example for indoor units connected downstream	Example REFNET joint C: indoor units 3+4+5+6+7+8	Example REFNET joint B: indoor units 7+8 Example REFNET header: indoor units 1+2+3+4+5+6	Example REFNET header: indoor units 1+2+3+4+5+6+7+8

Pipe size selection

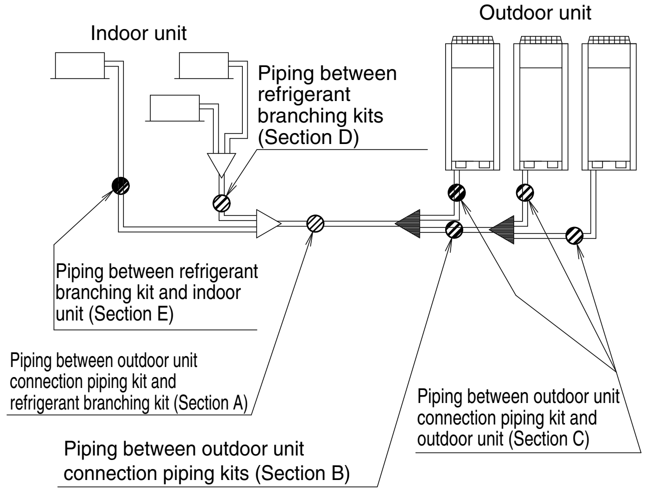
⚠ **Caution**

Refer to the diagram below and select the appropriate piping from the tables on the right.

<Single Outdoor Unit System>



<Multiple Outdoor Unit System>



Piping between outdoor unit (*2) and refrigerant branch kit (part A)

- Choose from the following table in accordance with the outdoor unit system capacity type. (Note1)

Outdoor capacity index	Piping size (O.D.)			
	Suction gas size		Liquid pipe	
	Standard size	Maximum size	Standard size	Maximum size
Q140	ϕ15.9	ϕ25.4	ϕ9.5	ϕ12.7
Q180	ϕ19.1			
Q280	ϕ22.2	ϕ28.6		ϕ15.9
Q360	ϕ25.4		ϕ12.7	
Q460	ϕ28.6	ϕ41.3		
Q500			ϕ15.9	ϕ19.1
Q540				

Piping between outdoor unit multi connection piping kits (part B)

- Choose from the following table in accordance with the total capacity of all the outdoor units connected upstream

(unit: mm)

Outdoor unit capacity type	Piping size (O.D.)	
	Suction gas pipe	Liquid pipe
280	ϕ22.2	ϕ9.5
360	ϕ25.4	ϕ12.7

Piping between outdoor unit multi connection piping kit and outdoor unit(part C)

- Choose from the following table in accordance with the capacity type of the outdoor unit connected

(unit: mm)

Outdoor capacity index	Piping size (O.D.)	
	Gas pipe	Liquid pipe
Q140	ϕ15.9	ϕ9.5
Q180	ϕ19.1	

Piping between refrigerant branch kits

- Choose from the following table in accordance with the total capacity index of all the indoor units connected below this. (part D)
- Do not let the connection piping exceed the main refrigerant piping size.

(Unit:mm)

Indoor capacity index	Piping size (O.D.)			
	Suction gas pipe		Liquid pipe	
	Standard size	Maximum size	Standard size	Maximum size
< 11.2 kW	ϕ15.9	ϕ19.1	ϕ9.5	ϕ12.7
11.2 kW ≤ x< 22.4 kW		ϕ25.4		
22.4 kW ≤ x< 33.0 kW	ϕ22.2	ϕ28.6		ϕ15.9
33.0 kW ≤ x< 37.0 kW	ϕ25.4		ϕ12.7	
37.0 kW ≤ x< 47.0 kW	ϕ28.6			
47.0 kW ≤ x< 71.0 kW		ϕ34.9	ϕ15.9	ϕ19.1
71.0 kW ≤	ϕ34.9	ϕ41.3	ϕ19.1	ϕ22.2

Piping between refrigerant branch kit and indoor unit

- Match to the size of the connection piping on the indoor unit. (part E)

(Unit:mm)

Indoor capacity index	Piping size (O.D.)			
	Suction gas pipe		Liquid pipe	
	Standard size	Maximum size	Standard size	Maximum size
Q20	ϕ12.7	ϕ15.9	ϕ6.4	ϕ9.5
Q25				
Q32				
Q40				
Q50				
Q63	ϕ15.9	ϕ19.1	ϕ9.5	ϕ12.7
Q80				
Q100		ϕ25.4		
Q125				
Q200	ϕ19.1	ϕ28.6		ϕ15.9
Q250	ϕ22.2			

How to calculate the additional refrigerant to be charged

Additional refrigerant to be charged R (kg)
(R should be rounded off in units of 0.1kg.)

R= ((Total length (m) of liquid piping size at φ19.1) ×0.26 kg/m + (Total length (m) of liquid piping size at φ6.4) ×0.18 kg/m + (Total length (m) of liquid piping size at φ12.7) ×0.12 kg/m
+ (Total length (m) of liquid piping size at φ9.5) ×0.059 kg/m + (Total length (m) of liquid piping size at φ6.4) ×0.022 kg/m) − [table below] + [ratio table below]

RQYQ140	2.4 kg	RQCYQ460	11.2 kg
RQYQ180	2.4 kg	RQCYQ500	11.2 kg
RQCYQ280	6.8 kg	RQCYQ540	11.2 kg
RQCYQ360	6.8 kg		

A ≤100%	0 kg
A > 100%	0.5 kg

(A: The ratio of total capacity index of connectable indoor units to outdoor capacity index (%))

Example for refrigerant branch using REFNET joint and REFNET header

In case the outdoor unit is RQCYQ540PY1 type and the piping lengths are as at right

a: φ15.9 × 30m	d: φ9.5 × 20m	g: φ9.5 × 20m	j : φ6.4 × 10m	s: φ9.5 × 1m
b: φ15.9 ×10m	e: φ9.5 × 20m	h: φ9.5 × 20m	k: φ6.4 × 10m	t : φ9.5 × 1m
c: φ9.5 × 20m	f : φ9.5 × 20m	i : φ9.5 × 10m	r: φ9.5 × 1m	u: φ12.7 × 3m

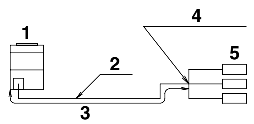
Total capacity of indoor unit: 116%

$R = (\underset{\text{a, b}}{40\times0.18} + \underset{\text{u}}{3\times0.12} + \underset{c\sim i,\ r\sim t}{1.33\times0.059} + \underset{\text{j, k}}{20\times0.022}) - \underset{\text{RQCYQ540PY1}}{11.2} + \underset{\text{116\%}}{0.5} = 5.147$ ⇨ 5.1 kg

∗Note 1

When the equivalent pipe length between outdoor unit multi connection piping kit and indoor units is 90m or more, the size of main pipes (both gas-side and liquid-side) must be increased to the following table.
Depending on the length of the piping, the capacity may drop, but even in such case it is able to increase the size of main pipes.

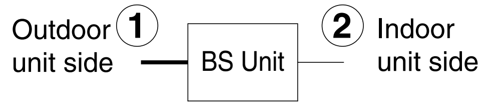
(Refer to figure below)
1. Outdoor unit
2. Main pipes
3. Increase
4. The first refrigerant branch kit
5. Indoor unit



Model name of outdoor unit system	Piping size (O.D.)	
	Gas pipe	Liquid pipe
RQYQ140	φ15.9 → φ19.1	φ9.5 → Not increased
RQYQ180	φ19.1 → φ22.2	φ9.5 → Not increased
RQCYQ280	φ22.2 → φ25.4	φ9.5 → φ12.7
RQCYQ360	φ25.4 → φ28.6	φ12.7 → φ15.9
RQCYQ460	φ28.6 → φ34.9	
RQCYQ500, 540		φ15.9 → φ19.1

■ Heat Recovery series (RQ(C)EQ)

Example of connection
(Connection of 8 indoor units)



1 Piping from outdoor unit to BS unit

—— (Bold): 3 pipes { Suction gas pipe, HP/LP gas pipe, Liquid pipe }

2 Piping from BS unit to indoor unit or Piping from Refrigerant branch kit to indoor unit used as cooling only

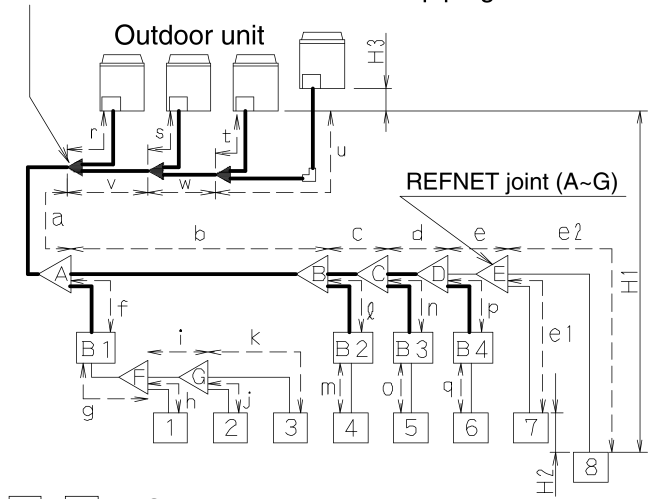
—— (Thin): 2 pipes { (Suction) gas pipe, Liquid pipe }

(*1) "◄=" Indicate the Outdoor unit multi connection piping kit.

(*2) In case of multi outdoor system, re-read "outdoor unit" to "the first Outdoor unit multi connection piping kit" as seen from the indoor unit.

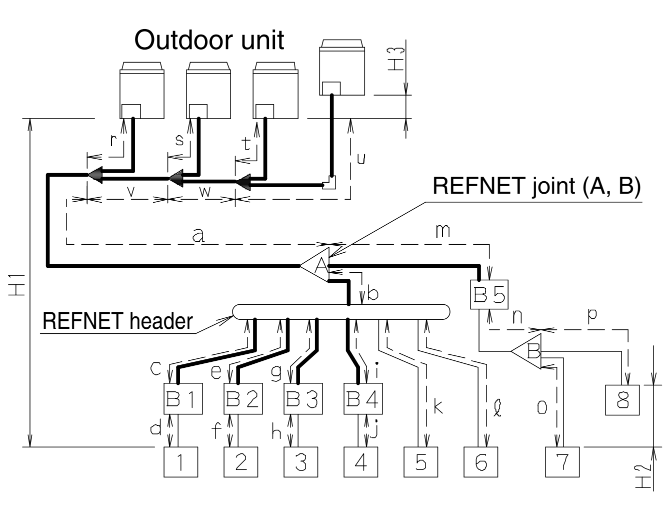
Multi outdoor system (RQCEQ)

Branch with REFNET joint



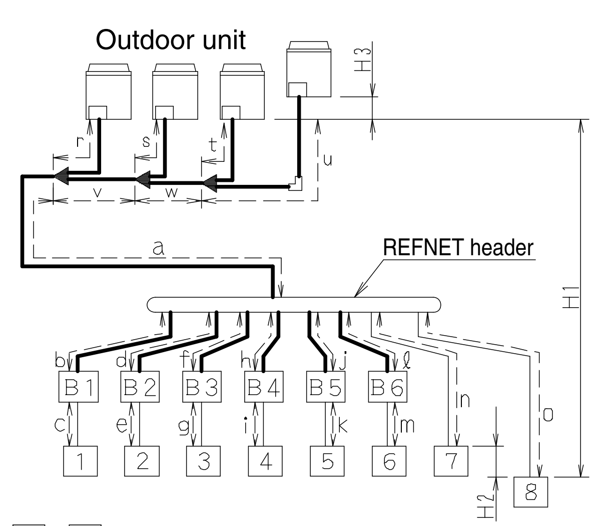
B1 ~ B4 : BS Unit
1 ~ 6 : Indoor unit (Cool/Heat selection possible)
7, 8 : Indoor unit (Cooling only)

Branch with REFNET joint and header



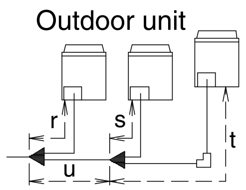
B1 ~ B5 : BS Unit
1 ~ 4, 7, 8 : Indoor unit (Cool/Heat selection possible)
5, 6 : Indoor unit (Cooling only)

Branch with REFNET header



B1 ~ B4 : BS Unit
1 ~ 6 : Indoor unit (Cool/Heat selection possible)
7, 8 : Indoor unit (Cooling only)

			Branch with REFNET joint	Branch with REFNET joint and header	Branch with REFNET header
Maximum allowable length	Between outdoor unit (*2) and indoor unit	Actual pipe length	Pipe length between outdoor unit (*2) and indoor unit ≤ 120m		
			Example 8 : a + b + c + d + e + s ≤ 120m	Example 6 : a + b + ℓ ≤ 120m, 8 : a + m + n + p ≤ 120m	Example 8 : a + o ≤ 120m
		Equivalent length	Equivalent pipe length between outdoor unit (*2) and indoor unit ≤ 150m (Note 1) (Assume equivalent pipe length of REFNET joint to be 0.5m, that of REFNET header to be 1m, that of BSVQ100, 160 to be 4m, that of BSVQ250 to be 6m for calculation purposes) (In case of BSV4Q100PV1 and BSV6Q100PV1 (combined type BS unit), calculate at 4m per 1 unit.)		
		Total extension length	Total piping length from outdoor unit (*2) to all indoor unit ≤ 300m		
	Between first outdoor unit multi connection piping kit and outdoor unit (in case of multi system)	Actual and Equivalent pipe length	Actual pipe length from first outdoor unit multi connection piping kit to outdoor unit ≤ 10m Equivalent pipe length from first outdoor unit multi connection piping kit to outdoor unit ≤ 13m		
Allowable height difference	Between outdoor and indoor units	Difference in height	Difference in height between outdoor unit and indoor unit (H1) ≤ 50m (Max 40m if the outdoor unit is below)		
	Between indoor and indoor units	Difference in height	Difference in height between adjacent indoor units (H2) ≤ 15m		
	Between outdoor and outdoor units	Difference in height	Difference in height between adjacent outdoor units (H3) ≤ 5m		
Allowable length after the branch		Actual pipe length	Actual pipe length from first refrigerant branch kit (either REFNET joint or REFNET header) to indoor unit ≤ 40m		
			Example 8 : b + c + d + e + s ≤ 40m	Example 6 : b + ℓ ≤ 40m, 8: m + n + p ≤ 40m	Example 8 : o ≤ 40m



r ≤ 10m
(Equivalent length ≤ 13m)
u + s ≤ 10m
(Equivalent length ≤ 13m)
u + t ≤ 10m
(Equivalent length ≤ 13m)

Outdoor unit multi connection piping kit and Refrigerant branch kit selection

• Refrigerant branch kit must be used to prescribed kit.
• Use this table for kit selection.

How to select the REFNET joint

- When using REFNET joint at the first branch counted from the outdoor unit side, choose from the following table in accordance with the outdoor unit capacity type. (Example : REFNET joint A)

Outdoor unit capacity type	Refrigerant branch kit name
Q280 type	KHRP25A33T
Q360~712 type	KHRP25A72T+KHRP25M72TP
Q744 type ~	KHRP25A73T+KHRP25M73TP

- Choose the REFNET joints other than the first branch from the following table in accordance with the total capacity index of all the indoor units connected below the REFNET joint

Indoor unit total capacity index	Refrigerant branch kit name	
	3 pipes	2 pipes
x < 200	KHRP25A22T	KHRP26A22T
200 ≤ x < 290	KHRP25A33T	KHRP26A33T
290 ≤ x < 640	KHRP25A72T+KHRP25M72TP	KHRP26A72T
640 ≤ x	KHRP25A73T+KHRP25M73TP	—

How to select the REFNET header

- Choose from the following table in accordance with the total capacity index of all the indoor units connected below the REFNET header.
- 250 type indoor unit can not be connected below the REFNET header.

Indoor unit total capacity index	Refrigerant branch kit name	
	3 pipes	2 pipes
x < 200	KHRP25M33H	KHRP26M22H or KHRP26M33H
200 ≤ x < 290		KHRP26M33H
290 ≤ x < 640	KHRP25M72H+KHRP25M72HP	KHRP26M72H
640 ≤ x	KHRP25M73H+KHRP25M73HP	KHRP26M73H+KHRP26M73HP

How to select the outdoor unit multi connection piping kit
(This is required when the system is multi outdoor unit system.)

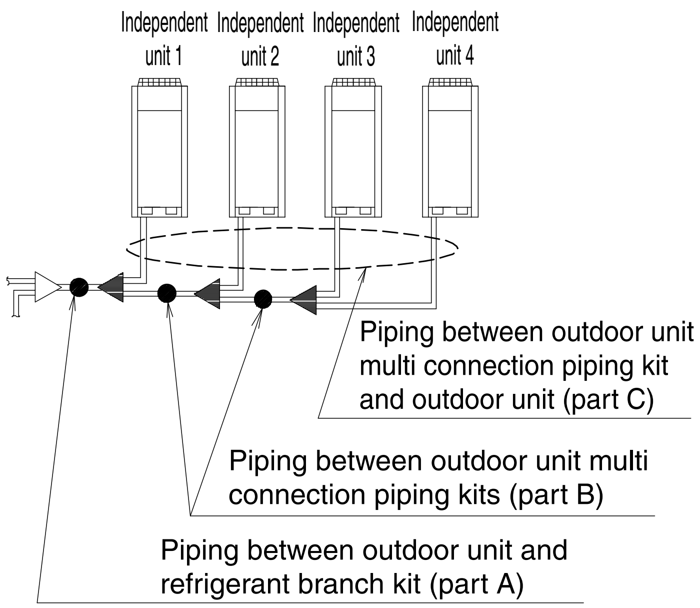
- Choose from the following table in accordance with the number of outdoor units.

Number of outdoor unit	Connecting piping kit name
2 units	BHFP26P36C
3 units	BHFP26P63C
4 units	BHFP26P84C

Example for indoor units connected downstream	Branch with REFNET joint	Branch with REFNET joint and header	Branch with REFNET header
	Example REFNET joint C : Indoor units 5 + 6 + 7 + 8	Example REFNET joint B : Indoor units 7 + 8 Example REFNET header : Indoor units 1 + 2 + 3 + 4 + 5 + 6	Example REFNET header : Indoor units 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8

Pipe size selection

Refer to the diagram below and select the appropriate piping from the tables on the right.



Piping between outdoor unit (*2) and refrigerant branch kit (part A)

- Choose from the following table in accordance with the outdoor unit system capacity type.

Model name of outdoor unit system	Piping size (O. D.)					
	Suction gas pipe		HP/LP gas pipe		Liquid pipe	
	Standard size	Maximum size	Standard size	Maximum size	Standard size	Maximum size
Q280 type	ϕ22.2	ϕ28.6	ϕ19.1	ϕ22.2	ϕ9.5	ϕ12.7
Q360 type	ϕ25.4				ϕ12.7	ϕ15.9
Q460 type	ϕ28.6	ϕ34.9	ϕ22.2	ϕ25.4		ϕ19.1
Q500 type					ϕ15.9	
Q540 type				ϕ28.6		
Q636 type			ϕ25.4			
Q712 type						
Q744 type	ϕ34.9	ϕ41.3			ϕ19.1	ϕ22.2
Q816 type			ϕ28.6			
Q848 type						

Piping between outdoor unit multi connection piping kits (part B)

- Choose from the following table in accordance with the total capacity of all the outdoor units connected upstream. (unit : mm)

Outdoor unit capacity type	Piping size (O. D.)		
	Suction gas pipe	HP/LP gas pipe	Liquid pipe
280·320	ϕ22.2	ϕ19.1	ϕ9.5
360~392	ϕ25.4		ϕ12.7
424	ϕ28.6	ϕ22.2	
500~532			ϕ15.9
604~636		ϕ25.4	

Piping between outdoor unit multi connection piping kit and outdoor unit (part C)

- Choose from the following table in accordance with the capacity type of the outdoor unit connected. (unit : mm)

Outdoor unit capacity type	Piping size (O. D.)		
	Suction gas pipe	HP/LP gas pipe	Liquid pipe
Q140 type	ϕ15.9	ϕ12.7	ϕ9.5
Q180·212 type	ϕ19.1	ϕ15.9	

Piping between refrigerant branch kits
Piping between refrigerant branch kit and BS unit
Piping between BS unit and refrigerant branch kit

- Choose from the following table in accordance with the total capacity type of all the indoor units connected downstream.
  *1 Connection piping must not exceed the refrigerant piping size between outdoor unit and refrigerant branch kit (part A).
  *2 When selecting 2 pipes line (gas pipe and liquid pipe), use suction gas pipe column for gas pipe and liquid pipe column for liquid pipe.

(unit : mm)

Indoor capacity index	Piping size (O.D.)					
	Suction gas pipe		HP/LP gas pipe		Liquid pipe	
	Standard size	Maximum size	Standard size	Maximum size	Standard size	Maximum size
< 56 kW	ϕ12.7	ϕ15.9	ϕ9.5	ϕ12.7	ϕ6.4	ϕ9.5
56 kW ≤ x< 112 kW	ϕ15.9	ϕ19.1	ϕ12.7	ϕ15.9	ϕ9.5	ϕ12.7
112 kW ≤ x< 160 kW		ϕ25.4				
160 kW ≤ x< 180 kW	ϕ19.1		ϕ15.9	ϕ19.1		
180 kW ≤ x< 224 kW						
224 kW ≤ x< 330 kW	ϕ22.2	ϕ28.6	ϕ19.4	ϕ22.2		ϕ15.9
330 kW ≤ x< 370 kW	ϕ25.4				ϕ12.7	
370 kW ≤ x< 470 kW	ϕ28.6			ϕ25.4		
470 kW ≤ x< 530 kW		ϕ34.9	ϕ25.4	ϕ28.6	ϕ15.9	ϕ19.1
530 kW ≤ x< 710 kW						
710 kW ≤ x< 784 kW	ϕ34.9	ϕ41.3			ϕ19.1	ϕ22.2
784 kW ≤ x< 1010 kW						
1010 kW ≤			ϕ28.6			

Piping between refrigerant branch kit, BS unit and indoor unit

- Match to the size of the connection piping on the indoor unit. (unit : mm)

Indoor capacity index	Piping size (O.D.)			
	Suction gas pipe		Liquid pipe	
	Standard size	Maximum size	Standard size	Maximum size
Q20	ϕ12.7	ϕ15.9	ϕ6.4	ϕ9.5
Q25				
Q32				
Q40				
Q50				
Q63	ϕ15.9	ϕ19.1	ϕ9.5	ϕ12.7
Q80				
Q100		ϕ25.4		
Q125				
Q200	ϕ19.1	ϕ28.6		ϕ15.9
Q250	ϕ22.2			

How to calculate the additional refrigerant to be charged

Additional refrigerant to be charged : R(kg)
(R should be rounded off in units of 0.1 kg.)

R = [(Total length(m) of liquid piping size at φ22.2) × 0.37 kg/m + (Total length(m) of liquid piping size at φ19.1) × 0.26 kg/m
+ (Total length(m) of liquid piping size at φ15.9) × 0.18 kg/m + (Total length(m) of liquid piping size at φ12.7) × 0.12 kg/m
+ (Total length(m) of liquid piping size at φ9.5) × 0.059 kg/m + (Total length(m) of liquid piping size at φ6.4) × 0.022 kg/m] × 1.02 − Correction amount by outdoor unit + (A value)

Correction amount by outdoor unit

RQCEQ280	5.2	RQCEQ636	11.2
RQCEQ360	5.8	RQCEQ712	13.8
RQCEQ460	9.1	RQCEQ744	14.3
RQCEQ500	9.4	RQCEQ816	15.1
RQCEQ540	9.7	RQCEQ848	15.6

A ≤ 100%	0 kg
A > 100%	0.5 kg

(A: The ratio of total capacity index of connectable indoor units to outdoor capacity index (%))

Example for refrigerant branch using REFNET joint and REFNET header for the systems and each pipe length as shown below.

Outdoor system : RQCEQ848PY1
Total capacity of indoor unit : 116%

a : φ19.1 × 30m	e : φ9.5 × 10m	i : φ9.5 × 10m	m : φ9.5 × 20m	r : φ9.5 × 1m	v : φ15.9 × 3m
b : φ19.1 × 20m	f : φ9.5 × 10m	j : φ9.5 × 10m	n : φ9.5 × 10m	s : φ9.5 × 1m	w : φ12.7 × 3m
c : φ9.5 × 10m	g : φ9.5 × 10m	k : φ9.5 × 20m	o : φ6.4 × 10m	t : φ9.5 × 1m	
d : φ9.5 × 10m	h : φ9.5 × 10m	l : φ9.5 × 20m	p : φ6.4 × 10m	u : φ9.5 × 3m	

R = (50 × 0.26 (a, b) + 3 × 0.18 (v) + 3 × 0.12 (w) + 156 × 0.059 (c~n, r~u) + 20 × 0.022 (o, p)) × 1.02 − 15.6 (RQCEQ848PY1) + 0.5 (112%)

= 8.915 ⇒ 8.9 kg

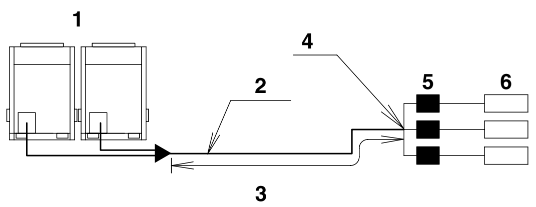
Round off in units of 0.1 kg.

Note 1.

When the equivalent pipe length between outdoor unit multi connection piping and indoor units is 90m or more, the size of main pipes on the liquid side (refer to figure 9) must be increased according to the right table.
(Do not increase the size of the suction gas pipe and HP/LP gas pipe.)

System	Liquid pipe
RQCEQ280P	φ9.5 → φ12.7
RQCEQ360~460P	φ12.7 → φ15.9
RQCEQ500~712P	φ15.9 → φ19.1
RQCEQ744~848P	φ19.1 → φ22.2

(Refer to figure below.)
1. Outdoor unit
2. Main pipes
3. Increase only liquid pipe size
4. First refrigerant branch kit
5. BS unit
6. Indoor unit



Revision History

Date	News No.	Contents
2010/7/12	M-10005	Correction of master-slave setting and Airnet address setting of SiBE341001_A

Warning

- Daikin Industries, Ltd.'s products are manufactured for export to numerous countries throughout the world. Daikin Industries, Ltd. does not have control over which products are exported to and used in a particular country. Prior to purchase, please therefore confirm with your local authorised importer, distributor and/or retailer whether this product conforms to the applicable standards, and is suitable for use, in the region where the product will be used. This statement does not purport to exclude, restrict or modify the application of any local legislation.
- Ask a qualified installer or contractor to install this product. Do not try to install the product yourself. Improper installation can result in water or refrigerant leakage, electrical shock, fire or explosion.
- Use only those parts and accessories supplied or specified by Daikin. Ask a qualified installer or contractor to install those parts and accessories. Use of unauthorised parts and accessories or improper installation of parts and accessories can result in water or refrigerant leakage, electrical shock, fire or explosion.
- Read the User's Manual carefully before using this product. The User's Manual provides important safety instructions and warnings. Be sure to follow these instructions and warnings.

If you have any enquiries, please contact your local importer, distributor and/or retailer.

Cautions on product corrosion

1. Air conditioners should not be installed in areas where corrosive gases, such as acid gas or alkaline gas, are produced.
2. If the outdoor unit is to be installed close to the sea shore, direct exposure to the sea breeze should be avoided. If you need to install the outdoor unit close to the sea shore, contact your local distributor.

JMI-0107

Organization:
DAIKIN INDUSTRIES, LTD.
AIR CONDITIONING MANUFACTURING DIVISION

Scope of Registration:
THE DESIGN/DEVELOPMENT AND MANUFACTURE OF COMMERCIAL AIR CONDITIONING, HEATING, COOLING, REFRIGERATING EQUIPMENT, COMMERCIAL HEATING EQUIPMENT, RESIDENTIAL AIR CONDITIONING EQUIPMENT, HEAT RECLAIM VENTILATION, AIR CLEANING EQUIPMENT, MARINE TYPE CONTAINER REFRIGERATION UNITS, COMPRESSORS AND VALVES.

JQA-1452

Organization:
DAIKIN INDUSTRIES (THAILAND) LTD.

Scope of Registration:
THE DESIGN/DEVELOPMENT AND MANUFACTURE OF AIR CONDITIONERS AND THE COMPONENTS INCLUDING COMPRESSORS USED FOR THEM

EC99J2044

All of the Daikin Group's business facilities and subsidiaries in Japan are certified under the ISO 14001 international standard for environment management.

Dealer

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